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January 31, 2006

VIA ELECTRONIC MAIL

Michael Bledsoe
California Integrated Waste Management Board
1001 "I" Street
P.O. Box 4025
Sacramento, CA 45812-4025

Re: Appeal of Hearing Panel Decision on Los Angeles County LEA's Approved Use of Alternative Daily Cover at the Sunshine Canyon Landfill

Dear Mr. Bledsoe:

Our office represents Browning-Ferris Industries of California ("BFI"). BFI hereby responds to and opposes the North Valley Coalition (NVC) appeal of the Los Angeles County Solid Waste Hearing Panel (Hearing Panel) decision that upheld the use of Construction and Demolition materials (C & D) as an approved Alternative Daily Cover (ADC) at the Sunshine Canyon Landfill.

We request that the California Integrated Waste Management Board (Board) dismiss the appeal filed by the NVC for failure to raise substantial issues. If the Board does not dismiss the appeal for failure to raise substantial issues, we request that the Board confirm and uphold the decisions of the LEA and the Hearing Panel and allow the continued use of C & D as alternative daily cover at the landfill.

I. INTRODUCTION

On December 19, 2005, the Hearing Panel correctly found that the Local Enforcement Agency (LEA) acted appropriately in approving the use of C & D as an approved ADC for the Sunshine Canyon Landfill. The NVC appeal of this decision does not raise substantial issues related to whether the Hearing Panel acted correctly. Rather, NVC largely ignores the only relevant issue, which is whether the Hearing Panel acted consistently with the standards and procedures set forth in state regulations and consistent with the Solid Waste Facility Permit when it upheld the use of C & D as ADC at the Landfill. Instead, what the NVC is really arguing is that C & D should not be used as ADC at landfills. This issue was decided when the Board adopted Title 27 CCR section

20690(b)(9). Accordingly, NVC's objection to this decision does not raise substantial issues, and is irrelevant to this proceeding.

With regard to the approval of the use of C & D as ADC at Sunshine Canyon, the LEA made all of the findings required by state regulations that are required in order to approve the use of ADC, and each finding is fully supported by evidence in the record.

II. FACTUAL BACKGROUND

On August 12, 2005, the Los Angeles County Department of Health Services, Solid Waste Management Program (the Local Enforcement Agency or LEA) approved an amendment to the Report of Disposal Site Information (RDSI) for the Sunshine Canyon Landfill County Extension, to add the use of processed C & D materials as an approved ADC. The Landfill had previously received approvals to use tarps and green waste as ADC.

On August 20, 2005, the NVC petitioned the LEA to hold a hearing to review the LEA's decision to approve the amendment to the RDSI for the Landfill to permit the use of C & D as ADC.

On October 11, 2005, the Hearing Panel conducted a hearing to review the LEA's approval of the amendment to the RDSI for the Landfill. The hearing was continued to and concluded on December 14, 2005.

On December 19, 2005, after consideration of the written and oral comments and other information offered by the LEA, BFI, and the NVC, the Hearing Panel, by a vote of two to one, found no failure on the part of the LEA to act as required by law or regulation in allowing the use of C & D as an ADC at the Landfill.

III. ARGUMENT

A. The decision of the Los Angeles County Solid Waste Facilities Hearing Panel should be upheld as being consistent with the laws and regulations of the state.

NVC challenges the decision of the Hearing Panel based primarily on the group's dislike of the use of ADC. NVC's dislike of ADC is not grounds to overturn the Hearing Panel's decision. The Board should only overturn the decision of an LEA or Hearing Panel if substantial evidence is found that the LEA or Hearing Panel acted inconsistently with the laws of the state or the Facility Permit. In fact, specific requirements for approving the use of any specific material as ADC are set forth in the state regulations. If those standards are met, the LEA must approve the use of the material.

In this case, the Hearing Panel made several findings showing the consistency of its decision with all applicable laws and the Facility Permit. The findings made by the Hearing Panel are summarized as follows:

> Section 21665 of Title 27 of the California Code of Regulations, subsection (c), provides that, the EA may approve and file [an] amendment to the [RDSI] without revising the permit if all of the following criteria are met:
>
> (i) The proposed change is consistent with all applicable certified and/or adopted CEQA documents, or has been determined by the EA that the change would not create any adverse environmental impacts and is exempt from the requirements of CEQA;
>
> (ii) The EA has deemed the proposed change acceptable and consistent with, but not limited to, state minimum standards or other applicable minimum standards; and
>
> (iii) The changes do not conflict with the terms and conditions in the current SWFP.

Hearing Panel Decision at 3-4.

As shown below, the evidence presented to the LEA and the Hearing Panel satisfies each of the regulatory requirements for the approval of C & D as alternative daily cover. More importantly, in general the NVC has failed to prove or even allege that these requirements have not been met.

1. The use of C & D materials as ADC at the Landfill is consistent with the Environmental Impact Report.

The NVC does not provide any evidence that the use of C & D materials as ADC is inconsistent with the EIR. The Hearing Panel found that the "EIR specifically discussed the reuse of recycled waste materials, including inorganic materials, in the daily operations of the Landfill, including landfill cover supplement." Hearing Panel Decision at 3. The Hearing Panel's decision was based on Appendix 6 of the EIR for the approval of the County Expansion Landfill, which was used as the EIR to support the issuance of the Solid Waste Facility Permit for the County Landfill. This document was introduced into evidence before the Hearing Panel and is included in the administrative record for this matter. Among other things, the EIR states that inorganics (asphalt, concrete, soil etc.) would be processed for the coverage of on-site roads and wet weather areas and for use as a daily landfill cover supplement. Therefore, this finding is fully supported by the record.

The only apparent allegation of inconsistency with the EIR is that traffic impacts associated with the use of ADC were not considered in the EIR. Those allegations were refuted. BFI presented information showing that the EIR analyzed the traffic impacts associated with a landfill that would receive up to 17,500 tons of waste per day. The approved County Landfill is allowed 6600 tons of refuse per day and other waste put to beneficial use. No evidence was presented showing that the combination of refuse and waste put to beneficial use exceeds 17,500 tons per day. Thus, the EIR adequately considered any possible traffic impacts that might be associated with the importation and use of C & D materials as ADC.

2. The use of C & D materials as ADC at the Landfill is consistent with state minimum standards.

The NVC has not provided any specific evidence to support its claim that the use of C & D materials as ADC is not consistent with state minimum standards. Rather, it has put forth a series of speculations and inaccurate statements, but no real evidence. In fact, BFI has complied with state procedures and state minimum standards with respect to ADC.

The regulations for ADC at Title 27 CCR § 20690 set forth the performance standards for ADC and list nine types of materials that have been found to meet the performance standards. One of the materials is "Processed Construction and Demolition Wastes and Materials". 27 CCR § 20690(b)(9). The regulation further provides that site specific demonstrations are not required for LEA approval for the materials listed in the section. 27 CCR § 20690(b). In order to be able to use such approved materials as ADC at a particular site an operator must file an amendment to the RDSI and have the amendment approved by the LEA. The evidence is uncontested that

BFI filed an amendment to the RDSI and that the amendment was approved by the LEA on August 12, 2005. The approval to use C & D as ADC does not limit the material to that received from a single site.

With regard to the substance of NVC's claim, stripped of its rhetoric the NVC appeal alleges that "the use of mixed waste fines" as ADC is improper, states that the materials are run over a single screening process, and that "particle size is the only difference between garbage and ADC" from the Falcon Refuse Center. NVC appeal at 2. These allegations do not show any failure to comply with state standards.

There is no support in the regulations for NVC's argument that the constituents of C & D ADC must be "segregated." The ADC regulations provide that processed construction and demolition wastes and materials include "rock, concrete, brick, sand, soil, ceramics, cured asphalt, lumber and wood, wood products, roofing material, plastic pipe, plant material when commingled from construction work, and *fines derived from processing* the above materials." 27 CCR § 20690(b)(9)(B). Thus, mixing of C & D materials is clearly contemplated by the regulations. Moreover, "processed" materials include "ground, pulverized, shredded, screened, source separated, or other processed ... material." 27 CCR § 20690(b)(9)(A). Thus, even if not specifically approved by the LEA, mixed C & D materials are appropriate under the "derived from" language of section 20690(b)(9)(B). The "derived from processing" language allows for mixed C & D because the act of processing encompasses the act of mixing them.

3. The addition of C & D as an approved ADC for the Landfill does not conflict with any term or condition in the Solid Waste Facilities Permit for the Landfill.

The Solid Waste Facility Permit for the Sunshine Canyon Landfill (#19-AA-0853) does not include any term or condition that would prohibit the use of C & D materials as ADC, and the NVC does not point to any such provision in its appeal. Thus, this finding is not in dispute.

B. <u>Wind conditions at the site do not justify a prohibition on the use of ADC.</u>

The NVC claims that wind conditions at the site make the use of ADC inappropriate. The issue of dust control was discussed at the hearing. BFI has dust control procedures in place and utilizes a number of techniques to control blowing dust. Among other things, the landfill operates up to 6 water trucks to moisten roads, disturbed surfaces and the working face throughout the working day and during non-working hours as necessary. In addition to water trucks, soil sealants are used to create a crust on disturbed areas and provide additional dust control. The working face at the County Landfill is over a mile from the nearest residence, and the landfill is located in a canyon so that there is an intervening mountain ridge between the landfill and the residential neighborhood to the south. Also, Rule 403 of the South Coast Air Quality Management District applies to the landfill and requires measures to prevent dust from blowing off-site.

In response to NVC concerns about blowing dust, BFI was required to perform a baseline air quality monitoring study of the potential impacts to the residential neighborhood from particulate matter (dust). The baseline study demonstrated that the air quality in the neighborhood compares favorably to other residential neighborhoods monitored by the SCAQMD and that the highest impacts to the community in terms of particulate matter occur when the wind is blowing from the nearby freeways rather than when it blows from the landfill toward the neighborhood. A copy of the baseline monitoring study is Attachment B to BFI's November 30, 2005 letter to Ms. Chang, which is part of the administrative record for this appeal. BFI is required to conduct air monitoring in the community on a quarterly basis.

C. NVC's general argument against Alternative Daily Cover

With no legitimate basis to challenge the decision of the Hearing Panel, NVC resorts to attacking the general use of ADC. Their arguments are irrelevant to this appeal because objections to the use of ADC in general are not appropriately raised in an appeal of a specific approval. If NVC has a problem with the use of C & D as ADC then it has a remedy: it should file an action challenging the regulation that allows the use of C & D as ADC.

Further, as stated by NVC in their appeal, the only question before the appeals board was simple: "Did the Los Angeles County [LEA] properly approve 'fines' from a mixed waste processing facility for use as [ADC] at the Sunshine Canyon Landfill." NVC appeal at 1. The only proper issue in contention at this point is whether the LEA followed state regulatory procedures and standards and made the necessary findings set forth in Title 27 CCR section 21665 when it determined that the BFI's request complied with the applicable laws and regulations. The evidence shows that the LEA's made the appropriate findings and that they were supported by the record.

For all of the above stated reasons, the CIWMB is urged to uphold the Hearing Board's approval of the use of C & D as alternative daily cover at the Sunshine Canyon landfill. We will be introducing into evidence the documents listed in Attachment A.

Very truly yours,

Sharon Rubalcava

Sharon Rubalcava
WESTON, BENSHOOF,
ROCHEFORT, RUBALCAVA & MacCUISH LLP

SFR/dtc
Attachments

cc: Mark Yanai, County of Los Angeles (w/attachments, via electronic mail)
Fred Pfaeffle, County of Los Angeles (w/attachments, via electronic mail)
Kelly Smith, The Smith Firm (w/attachments, via electronic mail)

ATTACHMENT A

DOCUMENTS TO BE CONSIDERED BY THE BOARD

1. Sunshine Canyon Landfill On-Site Solid Waste Recovery & Recycling Program: Sunshine Canyon Landfill Extension, Environmental Impact Report, (Responses to Comments – Volume A, Appendix 6) July 13, 1990

2. November 30, 2005 – Letter to Grace Chang re Appeal Hearing for Approval of the Use of Construction and Demolition Material as Daily Cover at the Sunshine Canyon Landfill This letter includes:

   a. South Coast Air Quality Management District Rule 403

   b. Results of the Baseline Ambient Air Monitoring Program for the Sunshine Canyon Landfill, June 6, 2003

3. Hearing Panel Exhibit 2 – Binder entitled Appeal Hearing for Approval of the Use of Construction and Demolition Material as ADC at Sunshine Canyon Landfill (as previously provided by Mr. Mark Yanai

[DOCUMENTS ATTACHED AS SEPARATE EMAIL ATTACHMENTS]

RESPONSES TO COMMENTS
VOLUME A

SUNSHINE CANYON LANDFILL EXTENSION

PROJECT NUMBER: SP 86312
CASE: CP 2556
STATE CLEARINGHOUSE NO.: 84082908

environmental impact report

ultrasystems

PREPARED FOR

COUNTY OF LOS ANGELES
DEPT. OF REGIONAL PLANNING

JULY 13,1990

09767

DEIR

APPENDIX 6

Sunshine Canyon Landfill On-Site

Solid Waste Recovery & Recycling Program

SUNSHINE CANYON LANDFILL

ON-SITE SOLID WASTE RECOVERY AND RECYLING PROGRAM

PREPARED FOR

BROWNING - FERRIS INDUSTRIES

PREPARED BY

ULTRASYSTEMS ENVIRONMENTAL SERVICES
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Recycled paper

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SUNSHINE CANYON LANDFILL

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APRIL 1990

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TABLE OF CONTENTS

1.0 INTRODUCTION

The land available for the disposal of the increasing amount of solid waste generated in the County of Los Angeles is rapidly being exhausted. The need for conserving the already dwindling landfill space has become a major concern for both landfill operators and local municipalities. It has been estimated that the County of Los Angeles is currently generating 50,000 tons per day (tpd) of solid waste and that 60,000 tpd will be generated by the year 2000. According to a 1988 study, by mid-1991 there will be a 6,400 tpd shortfall of solid waste disposal space if landfill expansions are not approved (1). More recent data being developed for the County Public Works Department indicates that this shortfall may actually be 8,500 tpd by the year 1992. This impending situation has been deemed a "crisis" by the City of Los Angeles, the County of Los Angeles and the County Sanitation Districts (1).

In response to this crisis several landfill expansions, (including the proposed Sunshine Canyon Landfill extension) and new landfill sites are being planned for the Los Angeles metropolitan area. Additionally, recycling of various materials present in the solid waste stream to reduce the County's dependence on landfills has become an essential component of the current approach to waste management.

Curbside residential recycling programs are increasingly reducing the quantities of waste that need to be transported to landfills. Recycling technologies are also being refined such that certain waste materials can be recovered and recycled at the landfill site. For instance, the Puente Hills and Scholl Canyon Landfills have implemented various yard waste, wood waste, and inorganic materials recycling programs.

To this end, Browning-Ferris Industries (BFI), with nearly 20 years of experience as a national leader in recycling, proposes a program of recovering and processing recyclable materials from the incoming Sunshine Canyon Landfill waste stream, and to provide environmentally sound alternatives for their re-use in the landfill's daily operations or for off-site export and reuse.

By combining the reduction of the waste stream, through innovative recycling technologies, with the increase in capacity provided by the landfill extension, for the disposal of materials that can not be reclaimed, BFI proposes to adopt an integrated waste management approach to solid waste disposal at the Sunshine Canyon Landfill.

2.0 ASSEMBLY BILL 939

Assembly Bill 939, codified as Sections 40000 through 49620 of the Public Resource Code, recently passed through the California State legislature and will be effective on January 1, 1990. This Bill requires that agencies undertake actions which, when implemented, will result in the reduction of solid waste entering landfills by means of an integrated County and City recycling and reuse program. To accomplish this, beginning on March 1, 1990 and every five years thereafter, each County is required to convene a task force to assist in coordinating the development of City Source Reduction and Recycling Elements ("SRRE").

The primary emphasis of the SRRE task force will be to examine and report on: 1) implementation of all feasible source reduction, recycling and composting programs; 2) the identification of landfill capacity for further waste disposal; and 3) the potential for waste reclamation in the region. In addition, each City SRRE shall include an implementation schedule which shows how it proposes to divert through source reduction, recycling and composting activities, 25 percent of all solid waste from landfill or transformation facilities by January 1, 1995, and 50 percent by January 1, 2000. The addition of this Bill to current legislation mandates the need for recycling programs in communities within Los Angeles County and at solid waste landfills.

3.0 WASTE STREAM COMPOSITION SUMMARY

A Waste Composition Study was performed at the Sunshine Canyon Landfill during April 1989 (Appendix A) which consisted of a visual survey for all incoming loads and a sorting survey that was limited to waste loads of non-residential (commercial, industrial, construction/demolition) origin. For the purpose of this report, only data produced from the sorting survey was analyzed since non-residential waste materials comprise the largest percentage of the waste stream and are more readily reclaimable at the landfill site. It should be noted that the Commercial, Industrial, and Construction/Demolition waste surveyed represents approximately 60 percent of the total waste stream entering Sunshine Canyon Landfill; various residential wastes comprise the remainder of the Landfill's waste stream.

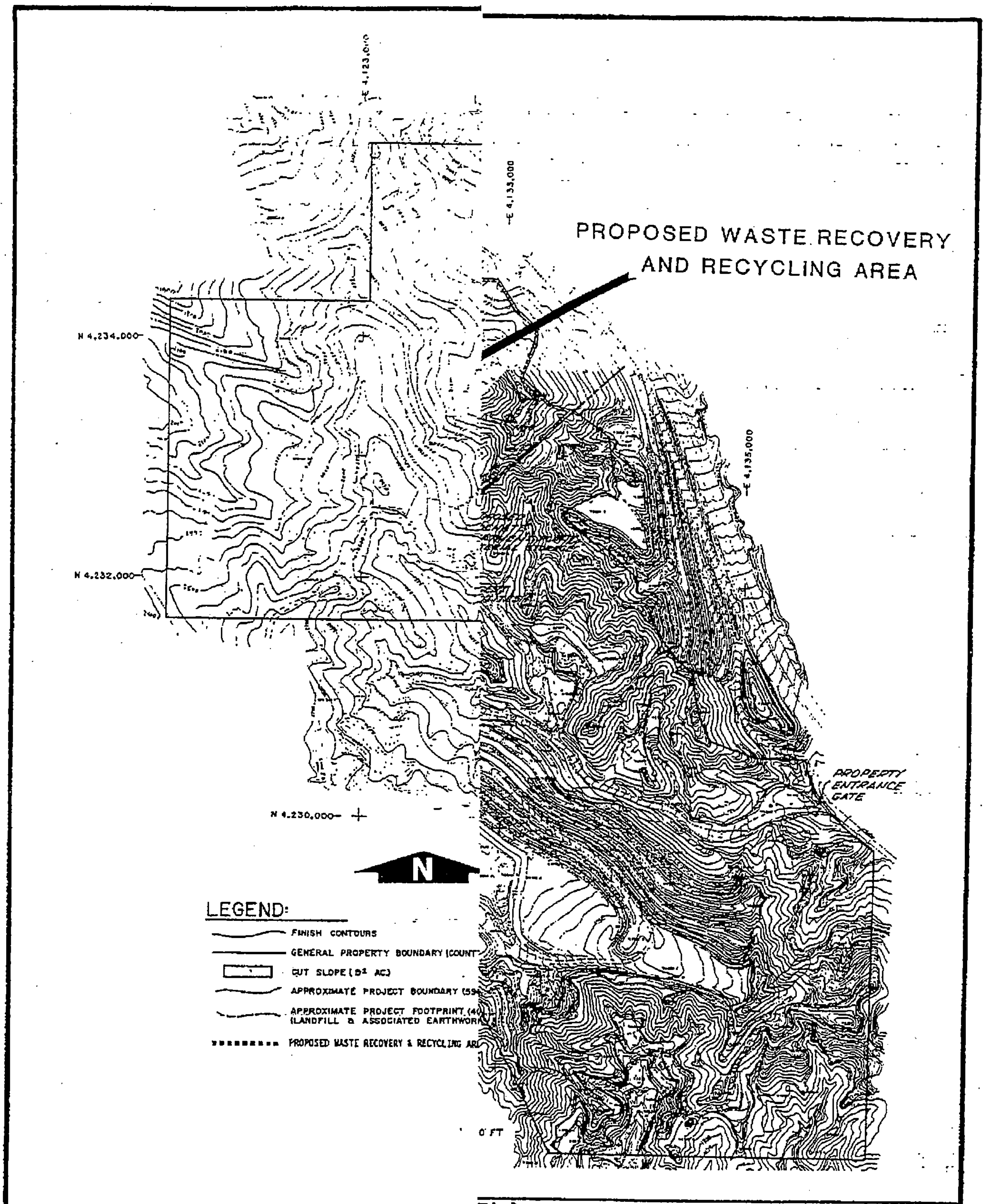
According to a study performed for Los Angeles County, the total waste stream for the County was characterized as 33 percent Residential, 33 percent Commercial/Industrial, and 33 percent Construction/Demolition mixed (1). These percentages for the Countywide waste stream largely resemble the findings for the Sunshine Canyon Landfill waste stream; however, Sunshine Canyon receives a slightly higher percentage of residential waste (40 percent) than the County average.

4.0 RECOVERY AND RECYCLING COMPONENTS

4.1 Operations

The proposed recovery and recycling operations will be located near other landfill support facilities in the County portion of the canyon near the City/County boundary line, obscured from primary view from residential areas surrounding the canyon (see Figure 1). Trucks entering the landfill will be briefly screened as to the source and approximate contents of the load. This will be accomplished by questioning drivers and/or visually inspecting open top trucks. Trucks containing adequate quantities of reclaimable materials will be diverted to recycling areas for unloading without disrupting the normal flow of disposal trucks in and out of the facility. Operations associated with the Recovery and Recycling Program will occur during normal business hours of the landfill operation.

Yard waste, wood waste and inorganic materials processing will be conducted in outdoor working areas approximately two to three acres in size. Processed materials will be kept in truck bins for temporary storage until transported off-site or used in on-site landfill operations. Corrugated paper will be sorted, processed and stored for off-site transportation within an enclosed facility. All surface runoff from these processing areas will be intercepted and diverted into the main water recovery, treatment and disposal system for the landfill. Any dust generated by the recycling operations will be controlled in accordance with measures implemented for other landfill extension operations.



Title:

LOCATION OF THE PROPOSED
WASTE RECOVERY & RECYCLING AREA

1

4.2 Commercial/Industrial/Construction Waste

4.2.1 Yard Waste

The Waste Composition Study estimated that 5.4 percent of the non-residential waste stream (3.2 percent of total incoming waste stream) entering Sunshine Canyon Landfill consists of yard waste and landscaping debris that may be processed for mulch (Appendix A). Incoming loads will be unloaded and sorted at a small staging area, then processed at an adjacent working area. The yard waste materials will be processed into small "fines" which can then be used as an amendment to landfill cover soils or for use as a plant mulch. Based on the percentage of such usable materials in the Sunshine Canyon non-residential waste stream, up to 384 tons per day (tpd) of processed yard waste could be diverted from the landfill (assuming a 12,000 tpd landfill extension average total waste stream).

It should also be noted that in a report addressing the solid waste composition for Los Angeles County, it was estimated that 30 percent of residential waste for the County consists of reusable organic material (1). If it is assumed that Sunshine Canyon's residential waste stream is a typical example of the County-wide waste stream, then by totaling the yard waste component of the landfill's non-residential and residential solid waste streams, up to 15 percent of the total waste entering Sunshine Canyon could potentially be processed for various on-site uses. However, the separation and recovery of yard wastes from the residential waste stream is not feasible without separation at its initial source. The implementation of residential recycling waste collection programs which are currently being planned in the Los Angeles region will increase the quantity of residential yard waste more readily available for recovery and recycling at the landfill.

A key factor to the success of processing and ultimate diversion of yard and garden wastes is the ability to market, or utilize on-site, the final product. Presently, the markets do not exist in the Los Angeles area that are capable of consuming all the processed yard waste that can be potentially produced. A more viable option is the utilization of the processed material on-site as a soil supplement for fill cover on the landfill, and also as a plant mulch used for on-site revegetation efforts. By using the yard waste in this manner, the need for a large permanent composting area is eliminated, and the material can be more readily transported to the landfill for use. If the processed organic material is to be used as plant mulch, it can be mixed with on-site soil and spread over areas targeted for revegetation or transported to oak tree mitigation planting sites for use. Aerobic decomposition of the material will thus take place in the soil where it will actually be utilized. Use of these processed yard wastes on the landfill site will minimize the need for transport of the materials off-site.

4.2.2 Wood Waste

Results of the Waste Composition Study (Appendix A) indicate that approximately 6.6 percent of the non-residential waste stream (4 percent of total incoming waste stream) entering the landfill consists of potentially recyclable wood materials. The study also indicated, specifically, that a large proportion of construction/demolition waste entering the landfill consists of wood waste, making its recovery from the waste stream more feasible. Given this information, up to 480 tpd (assuming a 12,000 tpd landfill extension average total waste stream) of potentially recyclable wood will be entering the landfill in a relatively easily recoverable state. Trucks entering the landfill will be redirected to a staging area where the wood waste will be unloaded and sorted. The wood processing operations will be performed at this staging area and the unusable waste will be transported to the landfill face for disposal.

The wood waste materials will be processed into woodchips which will be transported off-site for use in biomass fueled cogeneration electricity generating plants outside of the Los Angeles Basin. Trucks will transport the processed chips from the landfill regularly, with each truck having a carrying capacity of 15 to 25 tons. Assuming close to 100 percent recovery of usable wood waste and the transport of all processed chips off-site, the additional truck traffic due to transporting the material would be approximately 19 to 32 round trips per day (assuming a 12,000 tpd waste stream). Potential increases in transport truck traffic for off-site transport of all recycled materials would be accommodated by a reduction in the landfill's maximum potential incoming waste stream from 17,500 tpd to 16,700 tpd in order to maintain the same total maximum traffic volume for the landfill extension.

4.2.3 Inorganic Material

According to the Waste Composition Study (Appendix A), approximately 4.3 percent of the non-residential waste stream (2.6 percent of total incoming waste stream) entering Sunshine Canyon Landfill consists of inert inorganic materials (asphalt, concrete, soil, etc.). This inorganic material would thus make up approximately 312 tpd (assuming a 12,000 tpd landfill extension average total waste stream) of waste that can potentially be redirected from deposition into the landfill. Although this represents a smaller fraction of the total waste stream than yard waste or wood waste, these reusable materials can play a functional role in landfill operations. As is done currently for the existing landfill operation, the asphalt and concrete can be diverted and processed for the coverage of on-site roads and wet weather areas, and the soil as a daily landfill cover supplement.

The separation of these materials will be achieved by redirecting loads consisting primarily of inorganic waste to a small staging area for processing and storage or transportation to the active area of the landfill. Use of this inorganic waste at the landfill will eliminate the need to transport the processed materials off-site or to import construction materials on-site.

4.2.4 Corrugated Paper

The Waste Composition Study (Appendix A) for Sunshine Canyon Landfill indicates that the paper component (various paper grades) represents a substantial percentage of the non-residential waste stream. In particular, corrugated paper is present in a substantial 12.9 percent of the non-residential waste stream (7.8 percent of total incoming waste stream). The Waste Composition Study also estimated that approximately 75 percent of the paper arriving in non-residential loads had negligible amounts of contamination adhering to the paper. Thus, 9.7 percent of the non-residential waste stream (5.9 percent of total incoming waste stream) consists of these uncontaminated recoverable corrugated paper materials. In a Compaction Study performed for BFI, this material was found to consume a disproportionately large volume of air space in landfills relative to mixed residential waste.

Assuming complete recovery of all uncontaminated corrugated cartons (75 percent of the incoming corrugated paper), then approximately 708 tpd (assuming a 12,000 tpd landfill extension average total waste stream) of material could be processed for transport to off-site recycling locations. However, prior to implementation of a corrugated paper reclamation operation at the landfill, verification of the current waste stream quantities of this material will be made to determine if other waste reduction activities associated with the implementation of AB 939 have reduced corrugated paper quantities to a level such that its recovery and processing at the landfill is no longer viable.

The generally large size of corrugated cartons conceivably could be used to advantage with respect to manual/mechanical segregation from incoming waste loads. Incoming truck loads containing this material will be diverted to an unloading bay where the waste will be conveyed to a facility for sorting and processing. Corrugated paper will be bound into bales and transported off-site. Residual waste materials mixed in with corrugated paper loads will either be processed for other uses or transported to the landfill face for deposition.

The recovered paper will be transported off-site to potential buyers, with each transport truck having a carrying capacity of 15 to 25 tons. The movement of this potential quantity of processed paper could generate approximately 28 to 46 daily round trips (assuming a 12,000 tpd waste stream). As mentioned previously, the maximum potential incoming waste stream for the landfill will be reduced from 17,500 tpd to 16,700 tpd to accommodate the total potential increase in truck traffic for off-site transport of recycled materials, including corrugated paper, and thereby maintaining the same total maximum traffic volume for the landfill extension.

4.3 Residential Waste

Various materials are also present in the residential waste stream which can be recycled; for instance glass, metals and newspaper are often found in substantial quantities within typical residential waste. The most effective method for recovery and recycling of these materials is to separate and sort the residential waste at transfer stations close to the source of its generation, as is done currently in certain areas of the County, and then transport the reclaimed materials to available markets.

Recycling of residential waste materials at the landfill could be possible in the future in combination with implementation of curbside recycling programs and/or transfer station processing centers. Waste entering the landfill would thus be pre-separated and more easily sorted for recycling. If demand warrants it, Sunshine Canon could also serve as a transfer station and recycling center for residential waste generated in the neighboring communities (i.e., Granada Hills, Sylmar, San Fernando, etc.). Sunshine Canyon also currently receives residual unusable waste materials from transfer stations in the Cities of Beverly Hills and Santa Monica, and from the SWT transfer station in Compton, a facility owned by a subsidiary of BFI. The net result is a reduction in the solid waste stream requiring landfilling, and associated truck trips, due to materials recovery at these facilities near the waste generation sources.

The City of Los Angeles has developed and approved a Recycling Implementation Plan which will significantly alter existing operations and have long-range implications for future solid waste management activities in the City. The plan was adopted by the City Council on December 19, 1989. Several other cities throughout Los Angeles County have implemented similar recycling programs within the past two years. Browning-Ferris Industries is also a major contributor to the County-wide recycling effort. BFI's Sunvalley Trash Collection district currently serves 30,000 private residences with a curbside collection, sorting and recycling service in the County unincorporated area and the City of Pasadena. Additionally, BFI has implemented, as a contractor for the City of Glendale, a multi-family dwelling unit collection, sorting and recycling program, which will be serving approximately 40,000 apartment and condominium units in the City of Glendale by the end of 1990. The first phase of 3,000 apartments was implemented in April 1990.

At BFI's Newby Island Landfill in San Jose, similar studies and recycling programs led to development of The Recyclery (tm), an integrated facility which will combine recycling and materials recovery with an environmentally sound landfill. A profile of The Recyclery at Newby Island is included as Appendix B. Depending on Sunshine Canyon's location relative to waste generation sources and the available markets for reclaimed residential waste materials, such an expanded recycling program would be considered for Sunshine Canyon Landfill as a future facility.

5.0 CONCLUSION

Most recycling programs take a great deal of time to plan, develop and implement. In this program, BFI proposes several initiatives which can be implemented immediately and potentially produce a sizable reduction in the Sunshine Canyon Landfill waste stream. Assuming 100 percent recovery of the above-described non-residential recyclable materials, it could be expected that up to approximately 15.7 percent or 1,884 tpd (assuming a 12,000 tpd landfill extension average total waste stream) of Sunshine Canyon's total incoming waste stream could be diverted from deposition into the landfill. Given a maximum potential scenario of 16,700 tpd of waste entering the landfill (reduced from 17,500 tpd to accommodate increased recycling-related truck traffic), then approximately 2,621 tpd could be reclaimed through recycling.

Table 1

Summary of Waste Tonnage Reclaimed Per Day
From the Total Waste Stream

	% of Total Waste Stream	Tons Per Day (tpd) Reclaimed	
		12,000 tpd*	16,700 tpd**
Yard Waste	3.2%	384	534
Wood Waste	4.0%	480	668
Inorganic Material	2.6%	312	434
Corrugated Paper	5.9%**	708	985
	15.7%	1884	2621

* Average rate of incoming waste stream for landfill extension.
** Maximum rate of incoming waste stream for landfill extension.
*** This is 75% of corrugated paper in the non-residential fraction of the total wastestream. 75% is the estimated quantity of non-contaminated corrugated paper obtainable for recycling.

The removal of various recyclable materials from the residential waste stream through processing of curbside collected materials at the landfill site or at regional processing centers would further reduce the quantity of waste that would need to be landfilled.

Any increase in truck traffic and associated air emissions due to transportation of processed waste materials off-site would be offset by a commensurate reduction in the landfill's maximum potential incoming waste stream in order to maintain the same total maximum traffic volume generated by the landfill extension operation. Thus, at its maximum operation, the landfill will accept 16,700 tpd rather than 17,500 tpd of waste, a 4.6 percent reduction in the incoming waste stream.

The implementation of this Recovery and Recycling Program is highly feasible with respect to marketing the reclaimed materials. Currently, there is a market for processed wood waste as an energy source for cogeneration facilities throughout the western United States and the market for reclaimed corrugated paper is strong due to the increase in overseas demand, particularly in Taiwan (2). The yard waste and inorganic material will be used on-site for the daily operations of the landfill and in oak tree mitigation planting efforts until other potential markets become available.

All other programs that are currently being implemented and are planned for implementation throughout the County to meet the intent of AB 939 will be considered before implementation of this Recovery and Recycling Program at Sunshine Canyon Landfill due to their probable collective effect on the waste stream composition entering the landfill.

The present recycling plans for Sunshine Canyon Landfill, combined with assured capacity at the landfill extension for those materials which cannot be recycled, will provide the County metropolitan area with an environmentally sound integrated waste management approach to future solid waste disposal.

6.0 ENVIRONMENTAL ASSESSMENT OF RECYCLING PROGRAM

Incorporation of the herein-described Recovery and Recycling Program into the proposed Sunshine Canyon Landfill Extension will have a negligible effect on the impacts identified in the Draft Environmental Impact Report for the proposed extension.

6.1 Review of Issues

6.1.1 Geology

The facilities required for operations associated with the Recovery and Recycling Program will be located within the proposed landfill project area, near other infrastructure facilities, creating no new geologic hazard impacts.

6.1.2 Surface Water

The activities associated with the proposed Recovery and Recycling Program will have no new impacts related to additional surface water generation. Surface drainage controls designed for the landfill extension will also collect all runoff associated with the recycling facilities.

6.1.3 Groundwater

The processing of reclaimed materials may require water application for dust control. Any potential run-off produced will be collected, treated (if necessary) and discharged or recycled in an appropriate and acceptable manner without allowing infiltration into the landfill surface or leaving the site uncontrolled. No new impacts to groundwater resources will be created.

6.1.4 Biota

The facilities required for operations associated with the Recovery and Recycling Program will be located within the proposed landfill project area, creating no new impacts on the Canyon Biota.

6.1.5 Archaeological, Historical, and Paleontological Resources

The facilities required for operations associated with the Recovery and Recycling Program will be located within the proposed landfill project area, creating no new impacts on these resources.

6.1.6 Air Quality

Any pollutant emissions associated with equipment operations for the Recovery and Recycling Program will be required to meet South Coast Air Quality Management District (SCAQMD) standards. Any potential dust created will be controlled by implementing the Best Available Control Technology (BACT) in accordance with dust control measures implemented for other landfill extension operations. Emissions generated by any equipment associated with the recycling operations are not expected to be any greater than those associated with use of other operational equipment on-site.

Transport trucks would generate additional mobile source emissions; however, the total potential truck traffic generated by the landfill extension will not exceed volumes identified in the Draft Environmental Impact Report since the operator will reduce the maximum allowable incoming daily waste stream of 17,500 tpd to offset the increase in traffic associated with recycling activities. This will prevent any increase in total project vehicular emissions or new impacts on Air Quality.

6.1.7 Odor/Landfill Gas

No perceptible levels of odor will be produced by the operation of the recycling facilities. It is not intended to stockpile yard and/or wood waste materials; they will be either used for various purposes on the landfill site or transported off-site on a regular basis. Therefore, potential odors from decomposition of yard wastes are not expected.

6.1.8 Traffic/Circulation

There will be no overall increase in the total maximum traffic volume associated with the landfill extension. An increase in truck traffic related to the removal of reclaimed material from the recycling facilities to off-site users can be expected. The increase in truck trips, assuming 100 percent recovery of recyclable materials, could range from 47 to 79 round trips per day (assuming a 12,000 tpd landfill extension average total waste stream) for the removal of corrugated paper (28 to 47 round trips per day) and wood waste (19 to 32 round trips per day). At the maximum potential future waste stream of 17,500 tpd a total of 69 to 116 daily round trips could be expected for the removal of the processed waste.

To offset this potential increase in recycling operations related traffic, the landfill operator will reduce the maximum allowable incoming daily waste stream from 17,500 tpd to 16,700 tpd, thereby maintaining the same relative maximum potential traffic volume for the landfill extension project. An increase in the overall project traffic volume or new impacts to the local circulation system will not occur.

6.1.9 Noise

The location of the recovery and recycling facilities in the lower portion of the canyon near other landfill support facilities will be such that any noise produced will be masked by freeway noise and shielded from residential areas by the landfill project area's topographical characteristics. Processing machinery will be acoustically treated to reduce noise levels to acceptable standards for on-site operators.

6.1.10 Visual

The location of the Recovery and Recycling Program facilities will be in an area of the landfill project site that is not readily visible from the surrounding communities. The outdoor working areas associated with operations for yard, wood and inorganic waste processing will be relatively small scale and will not constitute major, noticeable on-site activities.

The facility to be used for corrugated paper processing may be visible from some locations aligned with the mouth of Sunshine Canyon. However, this structure would be of a rectangular shape no greater than 30 feet in height, located in the lower portion of the canyon, and would not be singularly distinguishable from other nearby landfill operations support structures.

6.1.11 Fire Service

The facilities required for operation of the Recovery and Recycling Program will be located within the proposed landfill area, creating no new impacts on the available fire service facilities.

6.1.12 Hazardous Materials

The facilities required for operations associated with the Recovery and Recycling Program will be located within the proposed landfill extension area; no new materials will be required for their operation, and any hazardous materials discovered in the waste stream entering recycling areas will be handled in accordance with established procedures for the normal landfill operations. Therefore, no change in impacts is expected.

7.0 REFERENCES

1. Solid Waste Management Status and Disposal Options in Los Angeles County, Department of Public Works, Bureau of Sanitation, City of Los Angeles, Department of Public Works - County of Los Angeles, Solid Waste Management Department, Los Angeles County Sanitation Districts, February 1988.

2. Quarterly Report of California's Recycling Market, January - March 1989, California Waste Management Board.

APPENDIX A

Sunshine Canyon Landfill
Waste Composition Study

Recycled paper

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November 30, 2005

VIA FEDERAL EXPRESS

Grace Chang
County of Los Angeles
Office of the County Counsel
500 West Temple Street
Los Angeles, CA 90012

Re: Appeal Hearing for Approval of the Use of Construction and Demolition Material as Alternative Daily Cover at the Sunshine Canyon Landfill

Dear Ms. Chang:

This letter will respond to the questions raised by Mr. Mohajer at the October 11, 2005 hearing on the above-captioned appeal. Before responding, BFI notes for the record that the questions asked go far beyond the issue on appeal, which is whether the Local Enforcement Agency's decision to approve the use of C&D waste as alternative daily cover (ADC) was proper and in accordance with the applicable state regulations. We submit that the LEA's decision was proper and must be affirmed. Nonetheless, in the spirit of cooperation, we provide the following answers to the questions posed by Mr. Mohajer.

1. *What are the definitions of "process C&D waste" and "C&D tailing waste"?*

California Code of Regulations (CCR), Title 14 section 17225.15 states that "Construction and Demolition wastes include the waste building materials, packaging and rubble resulting from construction, remodeling, repair and demolition operations on pavements, houses, commercial buildings and other structures". We were unable to find any definition of "C&D tailing waste" and this is not a term that is used by Browning-Ferris Industries personnel. The term was used by Mr. Marciniak in the report he prepared following his April 1, 2005, inspection. The report is found at Tab 6 of LEA Exhibit 1.

2. *Should the use of C&D materials as ADC be counted as a part of the landfill's allowable tonnage of 6,600 tons per day pursuant to the landfill's CUP?*

No. The Conditional Use Permit (CUP) for the County Landfill states that "net tonnage" placed at the landfill shall not exceed 6,600 tons per day or 36,000 tons per week (6,000 tons per day averaged based upon 6 working days per week). CUP conditions 10.e and f. The CUP also clearly states that "net tonnage" does not include "waste processed and *put to a beneficial use on the landfill* or separated or otherwise diverted from the waste stream and exported from the landfill for the purpose of recycling". CUP condition 10.g.

Beneficial use is not defined in the CUP, but its meaning is clearly defined in the state regulations governing landfills. Title 27 CCR sec. 20686 states that "beneficial reuse of solid wastes at a solid waste landfill shall include, but not be limited to, the following: alternative daily cover..." Also, Public Resources Code sec. 41781.3 states that the use of waste derived alternative daily cover constitutes diversion through recycling. Thus, the CUP clearly states that waste put to a beneficial use does not count in determining compliance with the daily net tonnage limits, and the state definition of beneficial reuse clearly states that ADC is considered to be a beneficial reuse. We view the term "beneficial use" in the CUP to be synonymous with "beneficial reuse" in the state regulations. The classification of ADC as diverted from the daily refuse tonnage limit is an historical practice and has been done with the full knowledge and acceptance of the LEA, the Department of Public Works, and Regional Planning and is consistent with the provisions of Public Resources Code sec. 41781.3.

The use of C&D waste as ADC is also consistent with the conditions in the Solid Waste Facility Permit (SWFP), and pursuant to the SWFP C&D waste used as daily cover does not count against the daily tonnage limit of 6600 tons. In Finding 1.F. (page 5), the SWFP states that "wastes such as asphalt, concrete, soil, rock, wood chips and Green Wastes", which are referred to as Exempt Wastes, must be weighed in at a special scale for "those wastes *which do not count toward the net daily tonnage limit*." In the SWFP Conditions, the permit states that the facility shall not landfill more than 6,600 tons of *refuse* on a daily basis or 36,000 tons on a weekly basis (condition 4, page 10) and will not accept more than 17,500 tons of *solid waste*, which is described as Exempt Waste plus Refuse (condition 5, page 11). The 17,500 limit applied after certain traffic improvements were made. "Refuse" is defined in Finding 1.E. to "not include Green Waste which, at some future date, may be approved as daily cover, *or waste processed* *and put to a beneficial use on the landfill* or separated or otherwise diverted." Thus, materials put to beneficial use are not limited to just green waste, and pursuant to the SWFP, in addition to 6,600 tons per day of refuse, the site could take another 10,900 tons per day of Exempt Wastes, if such waste were put to a beneficial use. (There is no tonnage limit in the CUP on receipt of materials put to beneficial use.)

Accordingly, BFI's use of green waste and C&D waste for ADC is consistent with the CUP, the SWFP and state regulations. Also, the acceptance of more than 6600 tons per day of waste is consistent with the CUP and the SWFP so long as such waste is put to beneficial use on the landfill. The use of C&D waste as ADC is considered beneficial use. The only tonnage limit that would apply to such wastes is the 17,500 tons per day limit for refuse and exempt waste in the SWFP. That limit has not been exceeded by BFI.

3. *Is the data submitted to the County by BFI accurate for AB 939 purposes?*

Yes. The Historical Disposal Summary Reports (Hearing Panel Exhibit No. 6) shows that the material used as ADC has been reported to the County Department of Public Works. During 2004 and the first quarter of 2005, the material was reported as green waste because that was the category that BFI and its inspector, Richard Lang, had determined was appropriate. On April 1, 2005, the state inspector informed BFI that Falcon Disposal's Report of Facility Information described the material being sent to Sunshine Canyon as C&D waste and recommended that the landfill's RDSI be changed to reflect a consistent designation. BFI had been unaware of Falcon's designation of the material as C&D waste. BFI prepared and submitted an amended RDSI to the LEA to reflect the new designation.

During the second quarter of 2005, which began on April 1, BFI continued to report the material as green waste believing that was appropriate because that was how the material was described in the current version of the RDSI. The amended RDSI was approved by letter dated August 12, 2005, and BFI will report the material pursuant to this new designation from that date forward. BFI will contact the Department of Public Works to determine if they believe it is necessary to amend any past reports to reflect the current designation. Regardless of whether the material is classified as green waste or C&D waste, it was put to beneficial use at the landfill and we believe it should have no effect on diversion attributed to any jurisdictions.

4. *Why did BFI fail to prepare the five-year permit review?*

The documentation for the five year review has been submitted. The report for the April 1, 2005, inspection noted that the application for permit review is required 150 days before the permit is due for review, but also noted that pursuant to 27 CCR sec. 21675(a) the LEA is required to give the operator notice no less than 180 days before it is due. No such notice was given by the LEA.

BFI admits that it was its responsibility to submit the necessary paperwork for the review and did so promptly when notified by Mr. Marciniak. However, in mitigation there were discussions between BFI and the LEA that it might be unnecessary to do the five year review because BFI has applied for a SWFP for the bridge area of the County Landfill that would replace the current permit for the County landfill. That application was first submitted on February 26, 2003 and was rejected over legal issues concerning the need to develop the bridge area. The application was resubmitted on February 2, 2004, and on September 8, 2005.

5. *What is the likelihood that there is asbestos in the ADC material?*

The chance of asbestos getting into the ADC is small and, even if present, the operational and dust control measures employed by the landfill would prevent the material from blowing off-site. Asbestos is classified as a hazardous waste and pursuant to the CUP the landfill is not allowed to accept hazardous waste. Therefore, BFI has every interest in the material arriving at the site free of asbestos.

C&D ADC is utilized on the active landfill face at the conclusion of the day's operation. C&D ADC is exposed for a period of no more than 24 hours, after which the area covered will receive additional refuse. Because of the site-specific 24 hour limitation on the use of C&D ADC, the facility does not accept or utilize this material on days preceding a day on which the landfill is closed. Clean dirt is used on those days. C&D ADC, when delivered to the landfill is dumped in an area in close proximity to the active landfill face and is placed over the completed refuse surface in a compacted layer between 6 inches and 18 inches thick, at the conclusion of the day's operations. All C&D ADC materials received on any day are utilized by the conclusion of that day and no materials remain stockpiled at the end of a day's operations.

As previously explained, there are many procedures in place to identify asbestos and prevent it from entering the waste stream. For demolition activities, local jurisdictions require demolition permits and one of the prerequisites for obtaining a demolition permit is to confirm the absence of asbestos prior to demolition or abate any asbestos prior to demolition. For facilities found to contain asbestos, the South Coast Air Quality Management District (SCAQMD) has a rule that applies to anyone engaging in a demolition or renovation activity that involves asbestos-containing material or ACM. The rule requires asbestos surveys, notification, and special procedures for ACM removal and transportation. A copy of SCAQMD Rule 1403 is Attachment A. Asbestos that is removed during demolition and renovation can only be disposed at a landfill that is permitted to accept such material. As stated previously, Sunshine Canyon is not allowed to accept asbestos.

At the last hearing, concern was raised that not everyone handling ACM knows of, or is complying with, the laws. To address that issue, the state has adopted regulations that require transfer station and landfill operators to train their employees to recognize the types of materials that are likely to contain asbestos. While it is true that the presence of asbestos can only be confirmed by microscopic analysis, types of materials such as floor or ceiling tiles, wall board and transite pipe are known to contain ACM. Loads containing these materials can be rejected or, if discovered later, the material can be segregated and removed for proper disposal. Also, the ADC material received at the landfill is screened material and has not been processed by grinding or shredding.

The North Valley Coalition's claims concerning blowing dust coming into the neighborhood are not borne out by the facts. Sunshine Canyon Landfill has an excellent record of dust control and employs a number of techniques to keep litter and dust from blowing off-site. Among other things, the landfill operates up to 6 water trucks to moisten roads, disturbed surfaces and the working face throughout the working day and during non-working hours as necessary. In addition to water trucks, soil sealants are used to create a crust on disturbed areas that provides additional dust control. Soil sealants can be used on surfaces that do not see truck traffic. It is also important to remember that the working face of the County landfill is over a mile from the nearest residence, and the landfill is located in a canyon so that there is an intervening mountain ridge line between the landfill and the residential neighborhood to the south.

In response to the NVC's concerns about blowing dust, the City of Los Angeles required BFI to perform a baseline air quality monitoring study of the potential impacts to the residential neighborhood from particulate matter (dust), diesel exhaust and landfill gas. The baseline study demonstrated that the air quality in the neighborhood compares favorably to other residential neighborhoods monitored by the SCAQMD and that the highest impacts to the community in terms of particulate matter and diesel exhaust occur when the wind is blowing from the nearby freeways rather than when it blows from the landfill toward the neighborhood. A copy of the baseline monitoring study is Attachment B.

Accordingly, Sunshine Canyon is subject to the same regulations as all other landfills with regard to the use of various materials as ADC, and no facts have been presented by the NVC to show why it should be treated differently than any other landfill. The system of permits and regulations that are in place should prevent most asbestos from entering the waste stream. For material that enters the waste stream, inspection procedures are in place to identify and remove the material. The concerns raised by the North Valley Coalition about the potential presence of asbestos in C&D waste apply equally to all landfills, yet the Integrated Waste Management Board has adopted regulations allowing C&D waste to be used as ADC. There is no reason for the Hearing Panel to second guess that determination, nor does it have the jurisdiction to do so. The LEA has followed all of the procedures set forth in Title 27 for the approval of C&D waste as ADC at a specific landfill. That decision must be upheld.

6. *Did the traffic analysis in the EIR consider truck trips associated with the ADC material?*

Yes. The amount of waste coming to the landfill is consistent with the traffic analysis contained in the Environmental Impact Report prepared by the County of Los Angeles in conjunction with the adoption of the CUP. The EIR discussed a proposed landfill on both the City and County portions of the canyon that would receive up to 17,500 tons of waste per day. The landfill that was eventually approved by the County was substantially smaller but clearly envisioned the receipt of wastes in excess of 6600 tons per day.

In conclusion, we hope that the responses to these questions will be helpful to the Hearing Panel. As demonstrated in BFI's letter of October 10, 2005, it is clear that the NVC appeal should be dismissed because the Local Enforcement Agency's approval was proper and in full compliance with state law. Their approval must be upheld because it does not violate state standards, it does not conflict with any term or condition of the SWFP or any of the permits referenced therein, and the use of C&D waste as ADC is consistent with the certified CEQA document for the County landfill.

Very truly yours,

Sharon Rubalcava

Sharon Rubalcava
WESTON BENSHOOF
ROCHEFORT RUBALCAVA & MacCUISH LLP

SFR/dtc
Attachments

cc: Fred Pfaeffle (w/attachments)
Wayde Hunter (w/attachments)

Attachment A

(Adopted October 6, 1989)(Amended April 8, 1994)

RULE 1403. ASBESTOS EMISSIONS FROM DEMOLITION/RENOVATION ACTIVITIES

(a) Purpose

The purpose of this rule is to specify work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials (ACM). The requirements for demolition and renovation activities include asbestos surveying, notification, ACM removal procedures and time schedules, ACM handling and clean-up procedures, and storage, disposal, and landfilling requirements for asbestos-containing waste materials (ACWM). All operators are required to maintain records, including waste shipment records, and are required to use appropriate warning labels, signs, and markings.

(b) Applicability

This rule, in whole or in part, is applicable to owners and operators of any demolition or renovation activity, and the associated disturbance of asbestos-containing material, any asbestos storage facility, or any active waste disposal site.

(c) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) ACTIVE WASTE DISPOSAL SITE is any disposal site that receives, or has received or processed ACWM within the preceding 365 calendar days.

(2) ADEQUATELY WET is the condition of being sufficiently mixed or penetrated with amended water to prevent the release of particulates or visible emissions. The process by which an adequately wet condition is achieved is by using a dispenser or water hose with a nozzle that permits the use of a fine, low-pressure spray or mist.

(3) AMENDED WATER is water to which a chemical wetting agent or surfactant has been added to improve penetration into ACM.

(4) ASBESTOS is the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, actinolite or tremolite.

(5) ASBESTOS-CONTAINING MATERIAL (ACM) is both friable asbestos-containing material or Class I nonfriable asbestos-containing material.

(6) ASBESTOS-CONTAINING WASTE MATERIAL (ACWM) is any waste that contains commercial asbestos and that is generated by a source subject to the provisions of this rule. ACWM includes, but is not limited to, ACM which is friable, has become friable, or has a high probability of becoming friable, or has been subjected to sanding, grinding, cutting, or abrading, and the waste generated from its disturbance, such as asbestos waste from control devices, particulate asbestos material, asbestos slurries, bags or containers that previously contained asbestos, used asbestos-contaminated plastic sheeting and clothing, and clean-up equipment waste, such as cloth rags or mop heads.

(7) ASBESTOS HAZARD EMERGENCY RESPONSE ACT (AHERA) is the act which legislates asbestos-related requirements for schools (40 CFR 763, Subpart E).

(8) CLASS I NONFRIABLE ASBESTOS-CONTAINING MATERIAL is material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), and that, when dry, can be broken, crumbled, pulverized, or reduced to powder in the course of demolition or renovation activities. Actions which may cause material to be broken, crumbled, pulverized, or reduced to powder include physical wear and disturbance by mechanical force, such as, but not limited to, sanding, sandblasting, cutting or abrading, improper handling or removal or leaching of matrix binders. Class I nonfriable asbestos-containing material includes, but is not limited to, fractured or crushed asbestos cement products, transite materials, mastic, roofing felts, roofing tiles, cement water pipes and resilient floor covering.

(9) CLASS II NONFRIABLE ASBESTOS-CONTAINING MATERIAL is all other material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), that is neither friable nor Class I nonfriable.

(10) COMMERCIAL ASBESTOS is any material containing asbestos that is extracted from asbestos ore.

(11) CUTTING is penetrating with a sharp-edged instrument and includes sawing, but does not include shearing, slicing, or punching.

(12) DEMOLITION is the wrecking or taking out of any load-supporting structural member of a facility and related handling operations or the intentional burning of any facility.

(13) EMERGENCY DEMOLITION is any demolition or remedial action under order of a state or local governmental agency. Such an order is generally issued for a structurally unsound facility in danger of imminent collapse.

(14) EMERGENCY RENOVATION is any renovation that was not planned and results from a sudden unexpected event that results in unsafe conditions. Such events include, but are not limited to, renovations necessitated by non-routine failures of equipment, earthquake or fire damage.

(15) ENCAPSULATION is the treatment of ACM with a material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers, as the encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

(16) FACILITY is any institutional, commercial, public, industrial or residential structure, installation, or building; any ship; and any active waste disposal site.

(17) FACILITY COMPONENT is any part of a facility including equipment.

(18) FRIABLE ASBESTOS-CONTAINING MATERIAL is material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

(19) GLOVEBAG is a sealed compartment with attached inner gloves used for handling ACM. When properly installed and used, glove bags provide a small work area enclosure used for small-scale asbestos stripping operations. Information on glovebag installation, equipment, and supplies, and work practices is contained in the Occupational Safety and Health Administration's final rule on occupational exposure to asbestos (Appendix G to 29 CFR 1926.58).

(20) HIGH EFFICIENCY PARTICULATE AIR (HEPA) FILTER is a filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometer in diameter or larger.

(21) INSTALLATION is any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under central control).

(22) ISOLATED WORK AREA is the immediate enclosed containment area in which the asbestos abatement activity takes place.

(23) LEAK-TIGHT is the condition whereby any contained solids or liquids are ~~prevented from escaping or spilling out~~.

(24) NONSCHEDULED RENOVATION OPERATION is a renovation operation necessitated by the routine failure of equipment, which is expected to occur within a given calendar year based on past operating experience, but for which an exact date cannot be predicted.

(25) OUTSIDE AIR is air outside of the facility or outside of the isolated work area.

(26) OWNER or OPERATOR OF A DEMOLITION OR RENOVATION ACTIVITY is any person who owns, leases, operates, controls or supervises activities at the facility being demolished or renovated; the demolition or renovation operation; or both.

(27) PERSON is any individual, firm, association, organization, partnership, business, trust, corporation, company, contractor, supplier, installer, user or owner, or any state or local government agency or public district or any other officer or employee thereof. PERSON also means the United States or its agencies to the extent authorized by Federal law.

(28) PLANNED RENOVATION is a renovation operation, or a number of such operations, in which the amount of ACM that will be removed or stripped within a given period of time can be predicted. Individual nonscheduled renovation operations are included if a number of such operations can be predicted to occur during a given period of time based on operating experience.

(29) PROJECT is any renovation or demolition activity, including site preparation and clean-up activity.

(30) REMOVAL is the taking out of ACM or facility components that contain or are covered with ACM from any facility.

(31) RENOVATION is the altering of a facility or the~~,~~ removing or stripping of one or more facility components in any way, including, but not limited to, the stripping or removal of ACM from facility components, retrofitting for fire protection, and the installation or removal of heating, ventilation, air conditioning (HVAC) systems. Activity involving the wrecking or taking out of load-supporting structural members are demolitions.

(32) RESIDENTIAL SINGLE UNIT DWELLING is a structure that contains only one residential unit. Apartment buildings, townhouses, and condominiums are not residential single unit dwellings.

(33) RESILIENT FLOOR COVERING is asbestos-containing floor tile, including ~~asphalt and vinyl floor tile, and sheet vinyl floor covering~~ containing more than one percent (1%) asbestos as determined by paragraph (h)(2).

(34) STRIPPING is the taking off of ACM from any part of a facility or facility component.

(35) STRUCTURAL MEMBER is any load-supporting member of a facility, such as beams and load-supporting walls; or any nonload-supporting member, such as ceilings and nonload-supporting walls.

(36) WASTE GENERATOR is any person who owns or operates a source subject to the provisions of this rule according to section (b), and whose act or process produces ACWM.

(37) WASTE SHIPMENT RECORD is the shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of ACWM as specified by the provisions of subdivision (f).

(38) WORKING DAY is Monday through Friday and includes holidays that fall on any of the days Monday through Friday.

(d) Requirements

A person subject to this rule shall prevent emissions of asbestos to the outside air by complying with the following requirements:

(1) Demolition and Renovation Activities

The owner or operator of any demolition or renovation activity shall comply with the following requirements:

(A) Facility Survey

The affected facility or facility components shall be thoroughly surveyed for the presence of asbestos prior to any demolition or renovation activity. The survey shall include the inspection, identification, and quantification of all friable, and Class I and Class II non-friable asbestos-containing material, and any physical sampling of materials. The survey shall be documented with the following information:

(i) The name, address, and telephone number of the person who conducted the survey;

(ii) A written statement of the qualifications of the person who conducted the survey, demonstrating compliance with paragraph (i)(4);

(iii) The dates the survey was conducted;

(iv) A listing of all suspected materials containing any asbestos and samples taken;

(v) The name, address, and telephone number of any laboratory used to conduct analyses of materials for asbestos content; and

(vi) A statement of qualification of the laboratory which conducted the analyses, demonstrating compliance with paragraph (h)(2).

(vii) A list of the test methods used, demonstrating compliance with subdivision (h), including sampling protocols and laboratory methods of analysis, test data, and any other information used to identify or quantify any materials containing asbestos.

(viii) Persons conducting asbestos surveys in accordance with subparagraph (d)(1)(a) shall be certified by Cal/OSHA pursuant to regulations required by subdivision (b) of Section 9021.5 of the Labor Code, and shall have taken and passed an EPA-approved Building Inspector Course and conform to the procedures outlined in the Course.

(B) Notification

The District shall be notified of the intent to demolish or renovate any facility. Notifications shall be submitted on District-approved forms, and shall be provided in accordance with the following requirements:

(i) Time Schedule

(I) Demolition or Renovation Activities

The District shall be notified by typewritten notification postmarked or delivered no later than 10 working days before any demolition or renovation activities other than emergency demolition, emergency renovation, or planned renovations involving individual nonscheduled renovation operations begin.

(II) Planned Renovation - Annual Notification

The District shall be notified by typewritten notification postmarked or delivered by December 17 of the year preceding the calendar year for which notice is being ~~given for planned renovation activities which~~ involve individual nonscheduled renovation operations.

(III) Emergency Demolition or Renovation
The District shall be notified by telephone, as soon as possible, but prior to any emergency demolition or renovation activity. The telephone notification shall be confirmed with a follow-up typewritten notification to the District postmarked or delivered within 48 hours of the telephone notification or the following business day.

(ii) Telephone and Written Notification Required Information
All telephone and written notifications shall include the following information:

(I) An indication of whether the notice is the original or a revised notification;

(II) Name, address and telephone number of both the owner and operator of the facility, supervising person, and the asbestos removal contractor, owner or operator;

(III) Address and location of the facility to be demolished or renovated and the type of operation: demolition or renovation;

(IV) Description of the facility or affected part of the facility to be demolished or renovated including the size (square meters or square feet and number of floors), age, and present or prior uses of the facility;

(V) The specific location of each renovation or demolition at the facility and a description of the facility components or structural members contributing to the ACM to be removed or stripped from the facility;

(VI) Scheduled project starting and completion dates of demolition or renovation. Notifications shall also include the ACM removal starting and completion dates for demolition or renovation; planned renovation activities involving individual nonscheduled renovation operations need only include the beginning and ending dates of the report period as described in subclause (d)(1)(B)(i)(II);

(VII) Brief description of work practices and engineering controls to be used to comply with this rule, including asbestos removal and waste handling emission control procedures;

(VIII) A separate estimate for each of the amounts of friable, Class I, and Class II nonfriable asbestos-containing material to be removed from the facility in terms of length of pipe in linear feet, surface area in square feet on other facility components, or volume in cubic feet if off the facility components. The total as equivalent surface area in square feet shall also be reported;

(IX) Name and location of waste disposal site where ACWM will be deposited.

Telephone notifications may consist of a combination of verbally and electronically communicated information if the electronic portion is transmitted and received in a legible, District-approved format.

(iii) Written Notification Additional Required Information

All written notifications shall include the following additional information:

(I) Description of procedures to be followed in the event that unexpected ACM is found or Class II nonfriable asbestos-containing material becomes crumbled, pulverized, or reduced to powder;

(II) California State Contractors License Certification number;

(III) Cal/OSHA Registration number;

(IV) Name and location address of off-site storage area for ACWM;

(V) Name, address, and telephone number of transporters used to transport ACWM off-site;

(VI) Procedures, including analytical methods, used to detect ~~the presence~~ of friable and nonfriable asbestos-containing material; and

(VII) Signed certification that at least one person trained as required in subparagraph (d)(1)(G) will supervise the stripping and removal described by this notification.

(iv) Emergency Demolition Additional Information

Telephone and written notification of all emergency demolition activities shall include the following additional information:

(I) The agency, name, title, telephone number and authority of the representative who ordered the emergency demolition; and

(II) A copy of the order, and the date on which the demolition was ordered to begin.

(v) Emergency Renovation Additional Information

Telephone and written notification of all emergency renovation activities shall include the following additional information:

(I) The name and phone number of the responsible manager or authorized person who is in charge of the emergency renovation; and

(II) The date and hour that the emergency occurred, a description of the sudden, unexpected event, and an explanation of how the event caused an unsafe condition, or would cause equipment damage or an unreasonable financial burden.

(vi) Notification Updates

All written notifications shall be updated when any of the following conditions arise:

(I) Change in Quantity of Asbestos

A change in the quantity of affected asbestos of 20 percent or more from the notified amount shall be reported to the District by telephone, or by facsimile, as soon as the information becomes available. The ~~telephone, or facsimile, notification shall be followed~~ by a typewritten notification to the District, postmarked or delivered within 48 hours or the following business day.

(II) Later Starting Date

A delay in the starting date of any demolition or renovation activity shall be reported to the District by telephone as soon as the information becomes available. The telephone notification shall be followed by a typewritten notification to the District submitted as soon as possible and postmarked no later than the original start date.

(III) Earlier Starting Date

A change in the starting date of any demolition or renovation activity to an earlier starting date shall be reported to the District by typewritten notification, postmarked no later than 10 working days before any demolition or renovation activities begin.

(IV) Completion Date Change

Planned changes in the completion date shall be reported to the District by typewritten notification, postmarked at least 2 calendar days before the original scheduled completion date. In the event planned renovations or demolitions are delayed or completed ahead of schedule, the District shall be notified by telephone, as soon as possible, but no later than the following business day. The telephone notifications shall be followed by typewritten notification to the District postmarked or delivered, within 48 hours of the telephone notification or the following business day.

(V) Planned Renovation Progress Report

Notifications for on-going planned renovation operations in which the scheduled starting and completions dates are more than 1 year apart shall be updated, by typewritten notification, postmarked or delivered every year of operation by December 17, unless the most recent written notification update was postmarked or delivered after October 1 of that year. The amount of ACM removed and the amount of ACM remaining to be removed shall be reported.

(C) Asbestos Removal Schedule

Material containing asbestos shall be removed from a facility according to the following schedule:

(i) Burning Demolitions

All ACM and Class II asbestos-containing material shall be removed from a facility prior to any demolition by intentional burning.

(ii) Renovations and Non-Burning Demolitions

All ACM shall be removed from a facility being demolished or renovated before any non-burning demolition or renovation activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal. ACM not accessible for testing or not discovered until after demolition activities begin may be removed after the start of non-burning demolition activities. Notwithstanding the above, asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products which are not friable and are not crumbled, cut, abraded, or otherwise not damaged and in good condition, may be removed after the start of non-burning demolition activities if prior approval from the District is obtained (Procedure 5). If the demolition activity involves any mechanical force such as, but not limited to, sanding, sandblasting, cutting, or abrading and thus would render the materials friable, they must be removed prior to demolition.

(D) Removal Procedures

One or more of the following procedures shall be used when removing or stripping ACM:

(i) Procedure 1 - HEPA Filtration

Remove ACM within an isolated work area. The following techniques shall be used during Procedure 1 ACM removal activities:

(I) All stationary objects and surfaces not intended for removal or stripping of ACM shall be covered with plastic sheeting;

(II) All air passageways, such as doors, windows, vents and registers in the work area, shall be covered and rendered air tight with plastic sheeting or hard wooden barriers with studded support. Air passageways used to provide makeup air for the isolated work space need not be covered;

(III) All sources of air movement, including the air-handling system, shall be shut off or temporarily modified to restrict air movement into the work zone;

(IV) The barriers used for the construction of the isolated work area shall be equipped with transparent viewing ports which allow outside observation of all stripping and removal of ACM;

(V) The isolated work area shall be vented, with negative air pressure to a HEPA filtration system, which shall be operated continuously from the commencement of removal activities through the final clean-up of the work area;

(VI) The HEPA filter shall be free of tears, fractures, holes or other types of damage and shall be securely latched and properly situated in the holding frame to prevent air leakage from the filtration system; and

(VII) ACM shall be adequately wet during the removal process.

(ii) Procedure 2 - Glovebag

Remove by the glovebag method or minienclosures designed and operated according to 29 CFR Section 1926.58, Appendix G, and current Cal/OSHA requirements.

(iii) Procedure 3 - Adequate Wetting

Remove ACM using the following techniques:

(I) All exposed ACM shall be adequately wet during cutting or dismantling procedures.

(II) ACM shall be adequately wet while it is being removed from facility components and prior to its removal from the facility.

(III) Drop cloths and tenting shall be used to contain the work area to the extent feasible.

(iv) Procedure 4 - Dry Removal

Obtain written approval from the Executive Officer's designee prior to using dry removal methods for the control of asbestos emissions when adequate wetting procedures in the renovation work area would unavoidably damage equipment or present a safety hazard. Dry removal methods may include one or more of the following:

(I) Use of a HEPA filtration system, operated in accordance with clause (d)(1)(D)(i), within an isolated work area;

(II) Use of a glovebag system, operated in accordance with clause (d)(1)(D)(ii); or

(III) Use of leak-tight wrapping or an approved alternative, to contain all ACM removed in units or sections prior to dismantlement.

(v) Procedure 5 - Approved Alternative

Use an alternative combination of techniques and/or engineering controls. Written approval from the Executive Officer or his designee shall be obtained prior to the use of Procedure 5 ACM removal activities.

(E) Handling Operations

All ACWM shall be collected and placed in leak-tight containers or wrapping. Such containers or wrappings shall be transparent no later than August 12, 1994. The following techniques shall be used:

(i) ACM shall be carefully lowered to the ground or a lower floor without dropping, throwing, sliding, or otherwise damaging or disturbing the ACM;

(ii) ACM which has been removed or stripped more than 50 feet above ground level and was not removed as units or in sections shall be transported to the ground via leak-tight chutes or containers;

(iii) ACWM shall be collected and sealed in leak-tight containers. ACWM shall be adequately wet prior to and during collection and packaging. Alternatively, areas of Class I nonfriable asbestos-containing material which have become friable or have been subjected to sanding, grinding, cutting, or abrading, may be sealed via encapsulation; and

(iv) All surfaces in the isolated work area shall be cleaned, with a vacuum system utilizing HEPA filtration, wet mopping and wipe down with water, or by an equivalent methods, prior to the dismantling of plastic barriers or sealed openings within the work area.

(F) Freezing Temperature Conditions

When the temperature at the point of wetting is below 0°C (32°F), the wetting provisions of subparagraph (d)(1)(D) or (d)(1)(F) shall be superseded by the following requirements:

(i) Facility components containing, coated with, or covered with ACM shall be removed as units or in sections to the maximum extent possible; and

(ii) The temperature in the area containing the facility components shall be recorded at the beginning, middle, and end of each workday during periods when wetting operations are suspended due to freezing temperatures. Daily temperature records shall be available for inspection by the District during normal business hours at the demolition or renovation site. Records shall be retained for at least 2 years.

(G) On-Site Representative

At ~~least one on-site representative~~, such as a foreman, manager, or other authorized representative, trained in accordance with the provisions of paragraphs (i)(1) and (i)(3), shall be present during the stripping, removing, handling, or disturbing of ACM. Evidence that the required training has been completed shall be posted at the demolition or renovation site and made available for inspection by the Executive Officer's designee.

(H) On-Site Proof

On-site proof of the following shall be provided upon request:

(i) California State Contractor's License certification number; and

(ii) Cal/OSHA Registration number.

Proof shall be consistent with the most recently updated information submitted in the notification.

(I) On-Site Storage

On-site storage of leak-tight containers shall be maintained within an enclosed storage area prior to transportation. Contents of the storage containers shall not be accessible to the general public and shall be locked when not in use.

(J) Disposal

All ACWM shall be disposed of at a waste disposal site that is operated in accordance with paragraph (d)(3) of this rule.

(K) Container Labelling

Leak-tight containers which contain ACWM shall be labelled as specified in subdivision (e).

(L) Transportation Vehicle Marking

Vehicles used to transport ACWM shall be marked, as specified in subdivision (e), during the loading and unloading of ACWM.

(M) Waste Shipment Records

Waste Shipment Records shall be prepared and handled in accordance with the provisions of paragraph (f)(1).

(N) Recordkeeping

Records shall be kept as specified in subdivision (g).

(2) ACWM Storage Facilities

The owner or operator of any ACWM storage facility shall comply with the following requirements:

(A) Maintenance and Handling

(i) ACWM shall be stored in leak-tight containers;

(ii) All leak-tight containers shall be labelled as specified in paragraph (e)(1); and

(iii) ACWM shall be stored in an enclosed locked area.

(B) Transportation Vehicle Marking

Vehicles used to transport ACWM shall be marked, as specified in paragraph (e)(3), during the loading and unloading of ACWM.

(C) Waste Shipment Records

Waste Shipment Records shall be handled in accordance with the provisions of paragraph (f)(2).

(D) Recordkeeping

Records shall be maintained as specified in paragraph (g)(2).

(3) Active Waste Disposal Sites

The owner or operator of any waste disposal site where ACWM is being deposited shall comply with the following requirements:

(A) Maintenance and Handling

(i) ACWM shall be in leak-tight containers;

(ii) Warning signs, as specified in paragraph (e)(2), shall be displayed at all entrances and at intervals of 330 feet or less along the property line of the site or along the perimeter of the sections of the site where ACWM is being deposited;

(iii) Access to the general public shall be deterred by maintaining a fence along the perimeter of the site or by using a natural barrier;

(iv) All ACWM shall be maintained in a separate disposal section;

(v) ACWM deposited at the site shall be covered with at least six (6) inches of nonasbestos-containing material at the end of normal business hours. The waste shall be compacted only after it has been completely covered with nonasbestos-containing material. A low pressure water spray or nontoxic dust suppressing chemical shall be used for any surface wetting after compaction; and

(vi) ACWM shall be covered with a minimum of an additional thirty (30) inches of compacted nonasbestos-containing material prior to final closure of the waste disposal site, and shall be maintained to prevent exposure of the ACWM.

(B) Transportation Vehicle Marking

Vehicles used to transport ACWM shall be marked, as specified in paragraph (e)(3), during the loading and unloading of ACWM.

(C) Waste Shipment Records

Waste Shipment Records shall be handled in accordance with the provisions of paragraph (f)(2).

(D) Recordkeeping

Records shall be maintained as specified in paragraph (g)(3).

(e) Warning Labels, Signs, and Markings

Warning labels, signs, and markings used to identify asbestos-related health hazards shall comply with the following requirements:

(1) Leak-Tight Containers

Leak-tight containers shall be labelled according to the following requirements:

(A) Warning labels for leak-tight containers and wrapping shall have letters of sufficient size and contrast as to be readily visible and legible, and shall contain the following information, or as specified by Occupational Safety and Health Standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.1001(j)(2) or 1926.58(k)(2)(iii), or current Cal/OSHA requirements:

CAUTION

Contains Asbestos Fibers

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

or

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

(B) Leak-tight containers that are transported off-site shall be labeled with the name of the waste generator and the location at which the waste was generated.

(2) Active Waste Disposal Sites

Warning signs for active waste disposal sites shall:

(A) Be displayed in such a manner and location that a person can easily read the legend;

(B) Conform to the requirements for 51 cm x 36 cm (20 inch x 14 inch) upright format signs specified in 29 CFR 1910.145 (d)(4) and this paragraph;

(C) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this subparagraph:

Legend	Notation
Asbestos Waste Disposal Site	2.5 cm (1 inch) Sans Serif, Gothic or Block
Do Not Create Dust	1.9 cm (3/4 inch) Sans Serif, Gothic or Block
Breathing Asbestos is Hazardous to Your Health	14 Point Gothic

; and

(D) Have spacing between any two lines at least equal to the height of the upper of the two lines.

(3) Transportation Vehicles

Markings for transportation vehicles shall:

(A) Be displayed in such a manner and location that a person can easily read the legend;

(B) Conform to the requirements for 51 cm x 36 cm (20 inch x 14 inch) upright format signs specified in 29 CFR 1910.145 (d)(4) and this paragraph; and

(C) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph:

Legend	Notation
DANGER	2.5 cm (1 inch) Sans Serif, Gothic or Block
ASBESTOS DUST HAZARD	2.5 cm (1 inch) Sans Serif, Gothic or Block
CANCER AND LUNG DISEASE HAZARD	1.9 cm (3/4 inch) Sans Serif, Gothic or Block
Authorized Personnel Only	14 Point Gothic

; and

(D) ~~Have spacing between any two lines at least equal~~ to the height of the upper of the two lines.

(f) Waste Shipment Records

Waste Shipment Records shall be prepared and handled in accordance with the following:

(1) Waste Generators

A waste generator shall comply with the following:

(A) Waste shipment information shall include, but not be limited to, the following:

(i) The name, address, and telephone number of the waste generator;

(ii) The name, address, and telephone number of the South Coast Air Quality Management District;

(iii) The quantity of ACWM in cubic meters or cubic yards;

(iv) The name and telephone number of the disposal site owner and operator;

(v) The name and physical site location of the disposal site;

(vi) The date transported;

(vii) The name, address, and telephone number of the transporter; and

(viii) A signed certification that the contents of this consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and in proper condition for highway transport according to applicable federal, state, and local regulations.

(B) A copy of the Waste Shipment Record shall be provided to the disposal site owner or operator at the same time the ACWM is delivered to the disposal site.

(C) If a copy of the Waste Shipment Record, signed by the owner or operator of the designated disposal site, is not received within 35 days of the date the ACWM was accepted by the initial transporter, the transporter and/or the owner or operator of the designated disposal site shall be contacted to determine the status of the waste shipment.

(D) If a copy of the Waste Shipment Record, signed by the owner or operator of the designated disposal site, is not received within 45 days of the date the ACWM was accepted by the initial transporter, a written report shall be submitted to the District and shall include the following:

(i) A copy of the Waste Shipment Record for which a confirmation of delivery was not received; and

(ii) A signed cover letter explaining the efforts taken to locate the ACWM shipment and the results of those efforts.

(2) Storage and Active Waste Disposal Facilities

The owner or operator of any storage facility or active waste disposal site shall comply with the following requirements:

(A) Waste shipment information shall be filled out on the Waste Shipment Record forms provided by the waste generator, for all ACWM received from an off-site facility, and shall include, but not be limited to, the following:

(i) The name, address, and telephone number of the waste generator;

(ii) The name, address, and telephone number of the transporter;

(iii) The quantity of ACWM received in cubic meters or cubic yards; and

(iv) The date of receipt.

(B) No shipment of ACWM shall be received from an off-site facility unless it is accompanied with a Waste Shipment Record signed by the waste generator.

(C) If there is a discrepancy between the quantity of ACWM designated in the Waste Shipment Record and the quantity actually received, and if the discrepancy cannot be resolved with the waste generator within 15 days of the date the ACWM was received, a written report shall be filed with the District. The report shall include the following:

(i) A copy of the Waste Shipment Record; and

(ii) A signed cover letter explaining the discrepancy, and the attempts to reconcile it.

(D) If any shipment of ACWM is not properly containerized, wrapped, ~~or encapsulated, a written report shall be filed with the District.~~ The report shall be postmarked or delivered within 48 hours after the shipment is received, or the following business day.

(E) A signed copy of the Waste Shipment Record shall be provided to the waste generator no later than 30 calendar days after the ACWM is delivered to the disposal site.

(g) Recordkeeping

The following records shall be maintained for not less than three (3) years and made available to the District upon request:

(1) Demolition and Renovation Activities

The owner or operator of any demolition or renovation activity shall maintain the following information:

(A) A copy of all survey-related documents;

(B) A copy of all submitted notifications. A copy of the most recently 5pdated written notification submitted in accordance with the provisions of this rule shall be maintained on-site;

(C) A copy of all permits, or written approvals obtained under the requirements of subparagraph (d)(1)(D);

(D) A copy of all Waste Shipment Records;

(E) All training informational materials used by an owner or operator to train supervisors or workers for the purposes of this rule; and

(F) A copy of all supervisors and workers training certificates and any annual reaccreditation records which demonstrate EPA-approved or state accreditation to perform asbestos-related work.

(2) Storage Facilities

The owner or operator of any storage facility shall maintain a copy of all Waste Shipment Records.

(3) Active Waste Disposal Sites

The owner or operator of an active waste disposal site shall maintain the following information:

(A) A description of the active waste disposal site, including the specific location, depth and area, and quantity, in cubic meters or cubic yards, of ACWM within the disposal site on a map or diagram of ~~the disposal area~~;

(B) A description of the methods used to comply with waste disposal requirements; and

(C) A copy of all Waste Shipment Records.

(4) In lieu of the requirements of paragraph (g)(1), the owner or operator of a renovation activity at any facility, in which less than 100 square feet of surface area of ACM on facility components is removed or stripped, shall maintain the following information:

(A) A copy of all survey-related documents;

(B) Records containing an estimate of the amount of ACM removed or stripped at each renovation subject to this paragraph;

(C) Type of removal controls used for each renovation; and

(D) A copy of all Waste Shipment Records.

(h) Sampling Protocols and Test Methods

(1) Sampling of materials suspected to contain asbestos shall be conducted following the provisions of 40 CFR Part 763.107·

(2) Analysis of materials for asbestos shall be determined by using SCAQMD Method 300-91 as detailed in the District's *Laboratory Methods of Analysis for Enforcement Samples* manual, or by using the Method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy.

Asbestos analyses performed to comply with this rule must be undertaken by laboratories accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

(i) Training Requirements

The owner or operator performing the demolition or renovation activity shall provide asbestos-related training as follows:

(1) On-site supervisory personnel shall successfully complete the Asbestos Abatement Contractor/Supervisor course pursuant to the Asbestos Hazard Emergency Response Act (AHERA), and obtain and maintain accreditation as an AHERA Asbestos Abatement Contractor/Supervisor.

(2) Workers shall successfuly complete the Abatement Worker course pursuant to the AHERA.

(3) Supervisory personnel and workers shall be trained on the provisions of this rule as well as on the provisions of 40 CFR Part 61.145, 61.146, 61.147 and 61.152 (Asbestos NESHAP provisions) and Part 763, and the means by which to comply with these provisions.

(j) Exemptions

(1) The notification requirements of subparagraph (d)(1)(B) and the training requirements of subdivision (i) shall not apply to renovation activities, other than planned renovation activities which involve non-scheduled renovation operations, in which less than 100 square feet of surface area of ACM are removed or stripped.

(2) The notification requirements of subparagraph (d)(1)(B) and the training requirements of subdivision (i) shall not apply to planned renovation activities which involve non-scheduled renovation operations, in which the total quantity of ACM to be removed or stripped within each calendar year of activity is less than 100 square feet of surface area.

(3) Subparagraph (d)(1)(A)(v), (vi) and (vii) and subclause (d)(1)(B)(iii)(VI) shall not apply to the owner or operator of any renovation or demolition activity, when the suspected material is removed, stripped, collected, and handled as ACM and disposed of in accordance with the provisions of this rule.

(4) Subclauses (d)(1)(A)(viii), (d)(1)(B)(iii)(II), (d)(1)(B)(iii)(III) and subparagraph (d)(1)(H) requiring proof of Cal/OSHA Registration and California State Contractors license certification shall not apply to persons performing work not subject to the registration requirements under the Labor Code, Section 6501.5 and Section 9021.5, and Business and Professions Code, Section 7058.5, respectively.

(5) The provisions of subparagraph (f)(2)(E) shall not apply to storage facilities that do not meet the definition of an active waste disposal site as defined by paragraph ©(1).

(6) The handling requirements of subclause (d)(1)(D)(i)(II), (d)(1)(D)(i)(V), and (d)(1)(D)(i)(VI), the training requirements of paragraph (i)(1) and (i)(2), the reporting of training certificate requirement of subclause (d)(1)(B)(iii)(VII), and the on-site proof of training requirement of subparagraph (d)(1)(G) and subdivision (i) shall not apply to the exclusive

removal of asbestos-containing packings, gaskets, resilient floor covering ~~and asphalt roofing products which are not friable~~, ~~have~~ not become friable, and have not been subjected to sanding, grinding, cutting, or abrading.

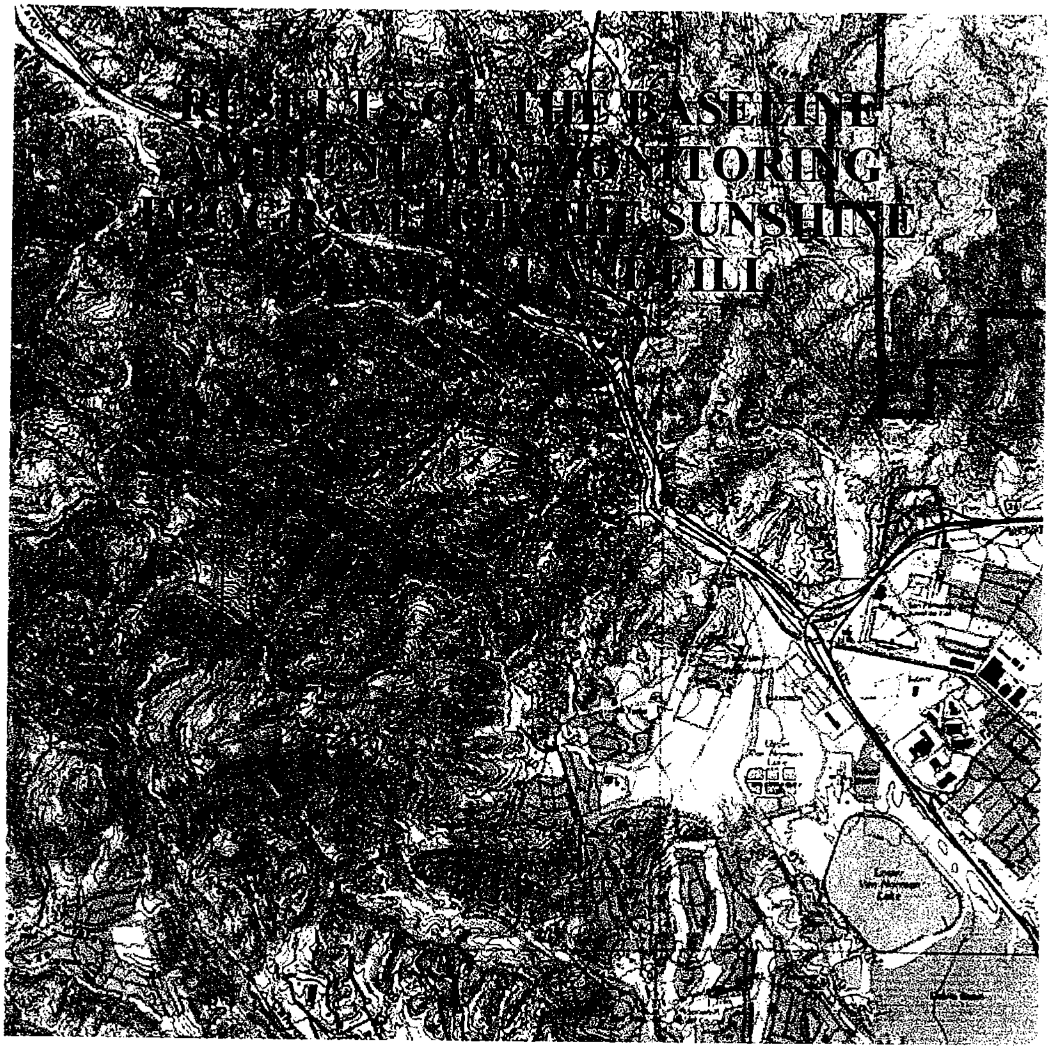
(7) The provisions of this rule shall not apply to an owner-occupant of a residential single-unit dwelling who conducts a renovation activity at that dwelling.

(8) The survey requirements of subparagraph (d)(1)(A) shall not apply to renovation activities of residential single-unit dwellings in which less than 100 square feet of surface area of ACM are removed or stripped.

Attachment B

ENVIRON

RESULTS OF THE BASELINE AMBIENT AIR MONITORING PROGRAM FOR THE SUNSHINE CANYON LANDFILL



Prepared for:

Browning-Ferris Industries of California, Inc.
Los Angeles, California

Prepared by:

ENVIRON International Corporation
Emeryville, California

June 6, 2003
Contract No. 03-9660A

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

BAM	Beta Attenuation Monitor
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CHS	Children's Health Study
DPM	Diesel Particulate Matter
MATES-II	Multiple Air Toxics Exposure Study
NAAQS	National Ambient Air Quality Standards
NIOSH	National Institute for Occupational Safety and Health
PSD	Prevention of Significant Deterioration
PM_{10}	Particulate Matter less than 10 microns in diameter
SCAQMD	South Coast Air Quality Management District
TOR	Thermal Optical Reflectance
USEPA	United States Environmental Protection Agency
WMO	World Meteorological Organization

EXECUTIVE SUMMARY

This report describes the results of the Sunshine Canyon Landfill ambient air monitoring program being conducted to determine baseline concentrations of particulate and diesel exhaust emissions at the landfill boundary and in the community located near the landfill in Granada Hills, California. The Sunshine Canyon Landfill (the "landfill") is located at 14747 San Fernando Road in Sylmar, California. The landfill consists of an operating landfill in the County of Los Angeles portion of Sunshine Canyon, an inactive landfill in the City of Los Angeles portion of Sunshine Canyon, and an approved expansion landfill also located in the City of Los Angeles. The baseline ambient air monitoring program is being conducted pursuant to Condition No. C.10.a of the "[Q] conditions and Related General Plan Findings" for the approved expansion landfill. Condition No. C.10.a requires that prior to the start of the land filling operations, an independent contractor conduct testing of dust and diesel particulates at Van Gogh Elementary School (the "school") in Granada Hills, California. Condition C.10.a also requires monitoring for landfill gas; this work is being performed pursuant to a separate workplan and results will be reported at a later date.

Sampling for particulate matter less than 10 microns (PM_{10}) and black (or elemental) carbon, a surrogate for diesel particulate matter (DPM), was conducted at the landfill and the school between November 22, 2001 and February 11, 2003. This report summarizes ENVIRON's analysis of monitoring data collected between November 22, 2001 and November 21, 2002 at the landfill and school monitors. This period represents the most complete one year of monitoring data.

Based on the directional monitoring data collected, it appears that the mobile sources concentrated on the nearby freeways and in the neighboring urbanized areas were the most significant contributors to concentrations of PM_{10} and black carbon measured at both the school and landfill monitors. Average short-term concentrations of PM_{10} and black carbon during periods of time when the wind was from the direction of the freeway were notably higher at both monitors.

It was also observed that the hourly concentrations of both PM_{10} and black carbon recorded at each monitor for the same hour correlated well at low to moderate concentrations, indicating that regional influences rather than individual local sources were primarily responsible for local air quality. Higher concentrations at the landfill monitor generally did not result in higher concentrations at the school monitor. This indicates that localized events at the landfill that may cause elevated concentrations of particulates at the landfill monitor are generally not reflected in the measurements taken at the school monitor.

Table ES-1 summarizes the federal and state PM_{10} standards, and the exceedances of those standards at each of the monitors. No exceedances of the federal PM_{10} 24-hour or annual average standards were measured at either the school monitor or the landfill monitor. Exceedances of the state PM_{10} 24-hour and annual average standards were detected at both monitors. The state 24-hour average PM_{10} standard was exceeded on 38 days out of 182 days of data collected at the school monitor. The percentage of exceedances (ratio of number of exceedances versus number of monitoring days) of the state PM_{10} 24-hour average standard occurring at the school monitor was compared to the percentage of exceedances at other South Coast Air Quality Management District (SCAQMD) monitors located within the South Coast air basin. The school monitor exceeded the state standards 24% of the time[1] compared with the other residential SCAQMD monitors, which have exceedances ranging from 5% to 67%.

[1] This exceedance rate is based on a comparison of those monitoring days coinciding with the SCAQMD's 6th-day monitoring schedule.

1.0 INTRODUCTION

This report describes the results of the Sunshine Canyon Landfill ambient air monitoring program being conducted to determine baseline concentrations of particulate and diesel exhaust emissions at the landfill boundary and in the community located near the landfill in Granada Hills, California. The Sunshine Canyon Landfill (the "landfill") is located at 14747 San Fernando Road in Sylmar, California.

The baseline ambient air monitoring program is being conducted pursuant to Condition No. C.10.a of the "[Q] conditions and Related General Plan Findings" that requires that prior to the start of the land filling operations at the City expansion landfill, an independent contractor conduct testing of dust and diesel particulates at Van Gogh Elementary School (the "school") in Granada Hills, California. Condition C.10.a also requires monitoring for landfill gas; this work is being performed pursuant to a separate workplan and results will be reported at a later date. Van Gogh Elementary School is located at 17160 Van Gogh Street in Granada Hills, California. A regional map depicting the location of the landfill and the school is presented in Figure 1-1. As shown on this figure, the school is 1.1 miles from the closest proposed fill area.

Sampling for particulate matter less than 10 microns (PM_{10}) and black (or elemental) carbon, a surrogate for diesel particulate matter (DPM), was conducted at the landfill and the school between November 22, 2001 and February 11, 2003. Data is typically analyzed in one year increments, in order to allow for seasonal variations. To provide for the most possible data for analysis, the most complete one year of monitoring data (November 22, 2001 to November 21, 2002) was selected for analysis. This report summarizes ENVIRON's analysis of monitoring data collected between November 22, 2001 and November 21, 2002 at the landfill and school monitors.

This report discusses the design of the air monitoring program in Section 2.0. Next, in Section 3.0, the air monitoring results are presented and discussed along with a discussion of the data completeness and the issues that arose during the monitoring program, as well as the analysis of the data. Section 3.0 also includes a comparison of the data with other monitoring data collected at other regional monitors. Finally, in Section 4.0, we present the conclusions of our data analysis.

2.0 Design of Monitoring Program

As required under Condition No. C.10.a, monitors were installed at the school and the landfill. Sampling began on November 22, 2001 and was conducted through February 11, 2003. The locations of the monitors are shown in Figure 2-1. Monitors at both sites measured PM_{10} and black carbon (a surrogate for DPM) on a continuous (every 15 to 60 minutes) real-time basis. There is also a meteorological station monitoring wind speeds and wind directions at each site. The monitoring was conducted using state-of-the-art measurement devices that obtain data continuously. Details of the design of the monitoring program are presented in Appendix A. This appendix includes information regarding monitor locations, PM_{10} and black carbon sampling methods, meteorological monitoring, and quality assurance. As described in Appendix A, the particulate monitoring methodology used is a United States Environmental Protection Agency (USEPA) reference method. As there is no reference method for DPM, Appendix A describes how the DPM monitoring method was chosen. The data is collected electronically and downloaded periodically as one-hour averages to long-term data storage.

3.0 DATA ANALYSIS AND RESULTS

This section presents the results of the baseline ambient air monitoring conducted at the landfill and the school, including a description of the data analysis methodology. A description of the database is included in Appendix B. Issues with the sampling program, including data completeness, equipment failure, and data gaps, are described in Appendix B. This section contains an analysis of the data by time of day and wind direction in order to better understand the sources of the measured PM_{10} and black carbon concentrations. The results presented in this section are based on sampling conducted between November 22, 2001 and November 21, 2002.

3.1 Data Analysis Methodology

Data posted to the database were analyzed to calculate average 1-hour and 24-hour concentrations. Since the purpose of the study was to determine the impact of the landfill on PM_{10} and DPM concentrations at the school, data were only included in the calculation of average 1-hour concentrations if validated data existed for that hour for both monitoring sites. To be conservative and consistent with California Air Resources Board (CARB) and South Coast Air Quality Management District (SCAQMD) practices, when the measured concentrations were less than the minimum detection limit of the instrument[2] ("non-detects"), the concentrations were included in the data analysis as half their respective detection limits[3]. Consistent with federal guidance[4], 24-hour average concentrations were calculated for all days with at least 18 hours of validated data. Where less than 18 hours of data were available, no daily average was calculated.

Evaluating the data on the basis of time-of-day and day-of-week may be of help in understanding the sources of PM_{10} and black carbon measured at the landfill and school. For example, freeway traffic, which produces both black carbon and PM_{10} would tend to result in more emissions during rush hours than during the middle of the day and weekends. Landfill operations would tend to emit more PM_{10} and black carbon (from heavy equipment operating in the landfill) during operating hours than during hours when the landfill is not open. By analyzing data collected during certain time periods, we can attempt to understand how activities are influencing concentrations measured at each of the monitors. As a result, at the request of the City of Los Angeles, the data set was further analyzed by dividing it into different weekly time periods. Two different time periods were selected that allow the separation of the possible influences of landfill activities and freeway traffic. The hours included in each of these data subsets are summarized

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[2] Concentrations of PM_{10} less than 5 $\mu g/m^3$ and concentrations of black carbon less than 50 ng/m^3

[3] SCAQMD. 2000. *MATES-II, Multiple Air Toxics Exposure Study in the South Coast Air Basin.* March. ES 7-8.

[4] 40 CFR Part 50.4

in Table 3-1. Landfill operating, non-rush hours, take place Monday through Friday from 10 a.m. to 2 p.m. and Saturday from 6 a.m. to 12 p.m. During this period, the landfill operates and traffic on the freeways is expected to be relatively light. Evening rush hours, which takes place from 3 p.m. to 7 p.m., occurs after the landfill activities have largely ceased for the day.

In order to better understand the sources of the measured concentrations, we calculated the average 1-hour PM_{10} and black carbon concentrations and average wind speeds based on wind directions recorded at the school and at the landfill. Because of the hilly terrain between the landfill and the school, wind directions measured at the school and landfill are not always similar. As a result, data is characterized by wind directions at both the landfill and the school. The wind direction categories for the monitors at the landfill and school are shown in Figures 3-1 and 3-2, respectively. Wind directions recorded by the landfill monitor were categorized as either going toward the school or not going toward the school. For the school monitor, wind directions were categorized as coming from the landfill toward the school (from 303° to 19° on the compass), coming from the freeway toward the school (19° to 180°), or "other" (coming from all other directions toward the school; 180° to 303°). Although there are also freeways in the direction of "other", they are further away, and therefore, thought to impact the air quality less than those that are closer. There is also urbanized area in both the direction of the "freeway" and "other".

3.2 Meteorological Monitoring

Wind speed and wind direction were measured at both the landfill and the school monitors. Table 3-2 presents a breakdown of the PM_{10} monitoring results by wind direction and daily time period, as measured at the landfill and school monitors. The table presents the wind direction measured at the school monitor in terms of three directional classes: from landfill, from freeway, and from "other", where the various classifications are as described above. The wind direction measured at the landfill monitor is presented in terms of two classes: from landfill and not from landfill. It was important to subdivide the region in this way because the goal of the monitoring study was to provide a baseline measurement of air quality at the school before the City portion of the landfill is active. In order to understand the baseline, it is helpful to evaluate the potential impact that baseline landfill activities may have on air quality at the school and to evaluate whether other sources might also have a significant impact on air quality at the school. By subdividing the region surrounding the school and categorizing the data according to the wind direction, the data can be analyzed in more general terms so that any trends or source contribution patterns may be identified as a function of wind direction, and hence, of the probable significant source of measured concentrations.

Meteorological monitors were placed at both the landfill and the school to ensure appropriate interpretation of the PM_{10} and black carbon monitoring data. The complex topography between the landfill and the school results, on occasion, in different wind directions recorded at the school and landfill monitors. The "All Monitoring Data" subtable in Table 3-2 shows that the landfill and the school monitor agreed on the general sector of the wind direction 71% of the time for which data was collected and for which the winds were faster than "calm" winds[5]. Although data collected during periods of time where the two monitors show winds coming from different sectors were still considered in the data analysis, it is important to note these differences between the two monitors.

There are two important periods during the day that help illustrate the relative contributions of the landfill and the freeway to the air quality at the school: evening rush hours (Monday through Friday from 3 p.m. to 7 p.m.) when the landfill is not operating and midday landfill operating hours (Monday through Friday from 10 a.m. to 2 p.m. and Saturday from 6 a.m. to 12 p.m.) when there would be relatively light freeway traffic. It should be noted that the traffic on the nearby freeways is still substantial during these periods; however, it is generally lighter than during normal rush hours. The subtable "Evening Rush Hours" in Table 3-2 shows that the fraction of time for which the two monitors agree on the general direction of the wind during evening rush hours was 88%[6]. The subtable "Landfill Operating, Non-Rush Hours" in Table 3-2 shows that this fraction was 81%[7] during landfill operating, non-rush hours. This shows that there was relatively good agreement between the two monitors regarding the general direction of the wind during these time periods.

3.3 Particulate Matter Sampling Results

This section of the report presents a description of the particulate matter sampling results. The sampling period, completeness, and statistics are described in addition to an evaluation of data at certain times of the day that characterize landfill operations and rush hours. In addition, the data is compared to state and federal standards and nearby measurements.

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[5] We note that in Table 3-4, in which black carbon results are presented, the fraction of time reported for each pair of wind directions (a pair of wind direction consists of the wind direction category determined by the landfill monitor and the wind direction category determined by the school monitor) is slightly different from that reported for the same pair in Table 3-2. For example, the total fraction of time for which both monitors agreed on the general direction of the wind, according to the black carbon data analysis, is 72%, compared with 71% for PM_{10}. This small difference is because there was a small difference in the hours for which each station collected particulate data and black carbon data due to periodic equipment stoppages.

[6] Based on the black carbon data summarized in Table 3-4, this fraction is 93%.

[7] Based on the black carbon data summarized in Table 3-4, this fraction is 82%.

3.3.1 Sampling Period

Between November 22, 2001 and November 21, 2002, a total of 3,323 hours of validated PM_{10} monitoring data were recorded at both the landfill and school monitors. This represents 38% of the total number of hours during this time period. The landfill monitor captured valid data 72% of the time and the school monitor captured valid data 52% of the time. The monitor at the school recorded an hourly average PM_{10} concentration that was higher than that recorded at the landfill monitor 31% of the hours for which validated data was available from both monitors. Table 3-2 presents the 1-hour average PM_{10} concentrations and average wind speeds for each monitor as a function of wind direction, as well as the percent occurrence of each wind direction category during that time. Results are presented for a full year of monitoring data as well as for the two data subsets described in Section 3.1. As noted in Section 3.1, data were included in the 1-hour average PM_{10} concentration calculations only if validated data for that hour existed for both monitoring sites. It should be noted that both invalidated data and rejected valid data remain in the database.

PM_{10} data for the landfill monitor and meteorological station was either not recorded or was not valid for 2,422 hours, or 28% of the hours between November 22, 2001 and November 21, 2002. There were eight periods of missing data that exceeded 24 hours. Data missing from either the meteorological station or the particulate monitor would create a data gap, as the wind direction is fundamental to the analysis. These periods are summarized in Table 3-3 and range from 33 hours to 474 hours. Reasons for these data gaps are summarized in Table 3-3 and include several instances with meteorological equipment failure, power outages, and one instance where the trailer footings failed. Data gaps of less than 24 hours typically result from the exclusion of data due to failure of the validation rules summarized in Appendix B; these shorter data gaps account for 1.3% of the monitoring period. Both the "evening rush hours" and "landfill operating, non-rush hours" data subsets did not have validated data 28% of the time.

PM_{10} data for the school monitor and meteorological station was either not recorded or was not valid for 4,186 hours, or 48% of the hours between November 22, 2001 and November 21, 2002. There were nine periods of missing data that exceeded 24 hours. Reasons for these gaps are summarized in Table 3-3 and include equipment failure of the particulate monitor, low or incorrect flow rates, and several power outages. These periods are summarized in Table 3-3 and range from 184 hours to 892 hours. Data gaps of less than 24 hours typically result from the exclusion of data due to failure of the validation rules summarized in Appendix B; these shorter data gaps account for 3.2% of the monitoring period. Both the "evening rush hours" and "landfill operating, non-rush hours" data subsets did not have validated data 50% of the time.

3.3.2 Analysis of 1-Hour PM_{10} Concentrations with Respect to Source Sectors

Average 1-hour PM_{10} concentrations were analyzed for a variety of conditions. The results of that analysis are summarized in Table 3-2 and discussed in this section. For hours that do not have calm winds[8], the overall average 1-hour PM_{10} concentration at the school monitor[9] was 33.7 $\mu g/m^3$. Overall, the average 1-hour PM_{10} concentration at the school monitor when the wind was determined to come from the landfill (as measured by the meteorological monitor at the school) was less than when the wind was coming from the freeway or from the "other" (non-landfill) sectors. The average 1-hour PM_{10} concentration at the school monitor when the wind was coming from the landfill (as measured by the meteorological monitor at the school)[10] was 20.1 $\mu g/m^3$. The average 1-hour PM_{10} concentration at the school monitor when the wind was not coming from the landfill (as measured by the meteorological monitor at the school)[11] was 38.0 $\mu g/m^3$. The average 1-hour PM_{10} concentration at the school monitor when the wind was coming from the freeway (as measured by the meteorological monitor at the school)[12] was 38.1 $\mu g/m^3$. These results are graphically displayed in Figure 3-3.

3.3.3 Comparison of Concentrations during Different Times of Day

In order to better understand the relative contributions of the landfill and the freeway to PM_{10} concentrations at the school monitor, analyses were conducted based on time of day and the direction of the wind. Two specific periods during the day were considered in this analysis: evening rush hours (Monday through Friday from 3 p.m. to 7 p.m.) to evaluate impacts on the school when the landfill is not operating and traffic is heavy, and midday landfill operating

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[8] Incorporating data collected during calm hours can be difficult, as source contribution cannot be attributed during calm conditions.

[9] This is a weighted average of the average 1-hour concentrations listed in Table 3-2 ("All Monitoring Data") for all hours excluding calm winds (weighted average of 21.0 $\mu g/m^3$, 30.2 $\mu g/m^3$, 30.5 $\mu g/m^3$, 17.5 $\mu g/m^3$, 41.8 $\mu g/m^3$, and 40.6 $\mu g/m^3$).

[10] This is a weighted average of the average 1-hour concentrations listed in Table 3-2 ("All Monitoring Data") for when the wind direction was determined to be from the landfill at the school monitor (weighted average of 21.0 $\mu g/m^3$ and 17.5 $\mu g/m^3$).

[11] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("All Monitoring Data") for when the wind direction was not from the landfill at the school monitor (weighted average of 30.2 $\mu g/m^3$, 30.5 $\mu g/m^3$, 41.8 $\mu g/m^3$, and 40.6 $\mu g/m^3$).

[12] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("All Monitoring Data") for hours when the wind direction was from the freeway at the school monitor (weighted average of 30.2 $\mu g/m^3$ and 41.8 $\mu g/m^3$).

hours (Monday through Friday from 10 a.m. to 2 p.m. and Saturday from 6 a.m. to 12 p.m.) to focus on landfill operational impacts on the school when there would be relatively light freeway traffic. The data are presented in several ways. Table 3-2 presents the average 1-hour concentrations during these periods in subtables entitled "Landfill Operating, Non-Rush Hours" and "Evening Rush Hours". These subtables demonstrate that the bulk of the PM_{10} measured at the school results from winds coming from the direction of the freeway and the "other" sector (not from the landfill). This is further discussed in this section.

3.3.3.1 Landfill Operating, Non-Rush Hours

During the midday period, the landfill is operating and the freeway traffic is relatively light. Table 3-2 (subtable "Landfill Operating, Non-Rush Hours"), shows that for hours which do not have calm winds, the 1-hour average PM_{10} concentration measured at the school monitor[13] was 38.2 $\mu g/m^3$. During the landfill operating, non-rush hours, the 1-hour average PM_{10} concentration measured at the school monitor during hours for which the meteorological monitor at the school registered winds coming from the landfill[14] (22.5 $\mu g/m^3$) was lower than the average concentration for all wind directions. From Table 3-2, we note that 81% of the winds during this time of day came from some sector other than the landfill (as measured by the meteorological monitor at the school). During hours when the winds were not coming from the landfill, but from another sector (as measured by the meteorological monitor at the school), the average 1-hour PM_{10} concentration at the school monitor[15] was 41.7 $\mu g/m^3$. These results are presented graphically in Figure 3-4. In general, the winds during this time period (see Figure 3-5) came largely from the south through southeast (typically light winds) or from the northwest through north (typically moderate winds of about 3 to 4 m/s). The main sources of PM_{10} southeast of the school monitor are likely the freeway and urbanized area, consisting of ground level emissions of both road dust and exhaust. It is evident that even during non-rush hours, the freeway and urbanized areas are still important contributors to the 1-hour PM_{10} concentrations measured at the school monitor.

[13] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("Landfill Operating, Non-Rush Hours") for all hours excluding calm winds (weighted average of 27.0 $\mu g/m^3$, 30.6 $\mu g/m^3$, 36.4 $\mu g/m^3$, 8.8 $\mu g/m^3$, 35.1 $\mu g/m^3$, and 43.8 $\mu g/m^3$).

[14] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("Landfill Operating, Non-Rush Hours") for hours when the wind direction was from the landfill at the school monitor (weighted average of 27.0 $\mu g/m^3$ and 8.8 $\mu g/m^3$).

[15] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("Landfill Operating, Non-Rush Hours") for when the wind direction was not from the landfill at the school monitor (weighted average of 30.6 $\mu g/m^3$, 36.4 $\mu g/m^3$, 35.1 $\mu g/m^3$, and 43.8 $\mu g/m^3$).

Figure 3-6 depicts the concentrations measured Monday through Friday from 10 a.m. and 2 p.m. and Saturday from 6 a.m. to 12 p.m. by wind direction, as measured at the school monitor, using a concentration rose. The length of each petal on the rose is proportional to the amount of time that wind was blowing from the direction of the petal. The colors of the petals signify concentrations as shown on the key to the figure. The black petals represent average concentrations above 40 $\mu g/m^3$. As Figure 3-6 illustrates, only the winds from the south through east had average concentrations above 40 $\mu g/m^3$. There are two possible explanations for this. First, this area is in the general direction of the freeways. Second, this is also the direction of the lowest wind speeds, as shown in the wind rose for these same hours (see Figure 3-5). The average concentrations seem to be a stronger function of wind speed than of source direction. Over two-thirds of hourly concentrations measured at the landfill monitor occurred while the wind was coming from the southeast (sectors encompassing the freeway and other non-landfill sources, as confirmed by measurements at the school monitor). In addition, the average 1-hour PM_{10} concentration at the landfill monitor during hours with winds coming from non-landfill sectors (as measured by the meteorological monitor at the landfill)[16] was 50.0 $\mu g/m^3$. It appears likely that the ambient PM_{10} concentrations during the midday are regional in nature rather than specific to operations at the landfill.

3.3.3.2 Evening Rush Hours

During the evening rush hours of Monday through Friday from 3 p.m. to 7 p.m., the landfill is not operating and freeway traffic is relatively heavy. Table 3-2 (subtable "Evening Rush Hours") shows that for hours which do not include calm winds, the 1-hour average PM_{10} concentration measured at the school monitor[17] was 34.4 $\mu g/m^3$. The average PM_{10} concentration at the school monitor for all hours during which the meteorological monitor at the school registered winds coming from the landfill[18] (16.6 $\mu g/m^3$) was lower than the average concentration for all wind directions. This is graphically displayed in Figure 3-7. We note that 79% of the winds during this time period came from some sector other than the landfill (as measured by the meteorological

[16] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("Landfill Operating, Non-Rush Hours") for hours when the wind direction was not from the landfill at the landfill monitor (weighted average of 56.4 $\mu g/m^3$, 40.8 $\mu g/m^3$, and 50.4 $\mu g/m^3$).

[17] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("Evening Rush Hours") for all hours excluding calm winds (weighted average of 12.8 $\mu g/m^3$, 23.3 $\mu g/m^3$, 20.1 $\mu g/m^3$, 25.8 $\mu g/m^3$, 37.8 $\mu g/m^3$, and 40.5 $\mu g/m^3$).

[18] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("Evening Rush Hours") for hours when the wind direction was from the landfill at the school monitor (weighted average of 12.8 $\mu g/m^3$ and 25.8 $\mu g/m^3$).

monitor at the school). During those hours when wind was not coming from the landfill sector (as measured by the meteorological monitor at the school), the average 1-hour PM_{10} concentration at the school monitor[19] was 38.9 $\mu g/m^3$. This is more than twice the average1-hour concentration measured by the school monitor for winds coming from the direction of the landfill. In general, the winds during evening rush hours were fairly evenly scattered around three quarters of the compass excluding the northeast quadrant (see Figure 3-8).

The average 1-hour PM_{10} concentration at the landfill monitor during hours with winds coming from non-landfill sectors (as measured by the meteorological monitor at the landfill)[20] was 45.1 $\mu g/m^3$. The average 1-hour PM_{10} concentration at the landfill monitor during hours when the winds were determined to not be from the landfill (as measured by the meteorological monitor at the landfill) and from the freeway (as measured by the meteorological monitor at the school) was 42.9 $\mu g/m^3$. It appears likely that the ambient PM_{10} concentrations measured at the school monitor during the evening rush hours, as compared to mid-day when the landfill is operating, are due in large part to freeway emissions, since the relative impact at both monitors appears to be similar under similar wind conditions.

Figure 3-9 depicts the concentrations measured Monday through Friday between 3 p.m. and 7 p.m. (evening rush hours) by wind direction, as measured at the school monitor, using a concentration rose. The length of each petal on the rose is proportional to the amount of time that wind was blowing from the direction of the petal. The colors of the petals signify concentrations as shown on the key to the figure. The black petals represent average concentrations above 40 $\mu g/m^3$. As Figure 3-9 illustrates, only the winds from the east through east-southeast had average concentrations above 40 $\mu g/m^3$. This is a distinct shift from the earlier mid-day concentration rose shown in Figure 3-6, and points clearly to the freeway as a source of PM_{10} during the rush hours. Figure 3-8 depicts the wind rose for PM_{10} sampling conducted during the evening rush hours. During the evening rush hours, the lowest wind speeds were from the south, yet the highest concentrations were from the east, the direction of the freeway.

[19] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("Evening Rush Hours") for hours when the wind direction was not from the landfill at the school monitor (weighted average of 23.3 $\mu g/m^3$, 20.1 $\mu g/m^3$, 37.8 $\mu g/m^3$, and 40.5 $\mu g/m^3$).

[20] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("Evening Rush Hours") for hours when the wind direction was not from the landfill at the landfill monitor (weighted average of 39.4 $\mu g/m^3$, 42.9 $\mu g/m^3$, and 45.7 $\mu g/m^3$).

3.3.3.3 Impact of High PM_{10} Concentrations at the Landfill on PM_{10} Concentrations at Van Gogh Elementary School

One issue of concern raised by the community has been whether high PM_{10} concentrations at the landfill berm due to activities at the landfill would result in high concentrations at the school monitor. Figures 3-10 and 3-11 present scatter plots of the hourly PM_{10} concentrations measured at the school versus the concentrations measured at the landfill for the same hour. For example, a value of 30 $\mu g/m^3$ at the school and 50 $\mu g/m^3$ at the landfill is shown as a point at 30 on the vertical axis and 50 on the horizontal axis. Scatter plots are used to show correlations between two measured sets of data. If the data were identical, a single line extending from the (0,0) point at a 45-degree angle would result. Figure 3-11 shows a subpart of Figure 3-10 in more detail and includes only those pairs of data points in which the PM_{10} concentration measured at the school monitor was less than 100 $\mu g/m^3$. The graphs appear to have two distinct areas: (1) data points clustered around a straight line and (2) a scattering of data points (530 or 16%) that are characterized by high PM_{10} concentrations at the landfill monitor and relatively low PM_{10} concentrations at the school monitor (ratio of landfill concentration to school concentration is greater than 2 to 1). This indicates that when measured PM_{10} concentrations are low to moderate, regional influences dominate and the measured concentrations at the two monitoring locations are similar. When high concentrations are measured at the landfill monitor, they generally do not result in high concentrations at the school monitor. This indicates that landfill activities that result in elevated PM_{10} concentrations at the landfill monitor do not necessarily result in high concentration readings at the school monitor.

3.3.4 Analysis of 24-Hour and Annual Average Concentrations

PM_{10} concentrations are usually reported in comparison to the two regulatory standard averaging periods: 24-hour and annual. For each of these averaging periods, there are California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). This section contains a comparison of the 24-hour and annual average values measured at the school and landfill monitors with the CAAQS and NAAQS. In addition, the 24-hour and annual average PM_{10} concentrations measured at the school monitor are compared with concentrations measured at other monitoring stations in the SCAQMD.

3.3.4.1 Comparison with Regulatory Standards

Twenty-four hour average PM_{10} concentrations were calculated from hourly data for days with at least 18 hours of valid data. The maximum 24-hour average PM_{10} concentrations at the school and landfill monitors were 112.5 $\mu g/m^3$ and 135.3 $\mu g/m^3$, respectively. The average 24-hour PM_{10} concentration at the school monitor was 33.2 $\mu g/m^3$, with a standard deviation[21] of 21.3 $\mu g/m^3$. The 90% confidence interval[22] for the school monitor was 30.6 $\mu g/m^3$ to 35.8 $\mu g/m^3$. The average 24-hour PM_{10} concentration at the landfill monitor was 49.3 $\mu g/m^3$ with a standard deviation of 26.9 $\mu g/m^3$. The 90% confidence interval for the landfill monitor was 46.6 $\mu g/m^3$ to 52.0 $\mu g/m^3$. This is shown graphically in Figure 3-12. Annual average PM_{10} concentrations were calculated based on hourly data collected between November 22, 2001 and November 21, 2002. The annual average PM_{10} concentrations at the school and landfill monitors were 33.1 $\mu g/m^3$ and 49.2 $\mu g/m^3$, respectively.

No monitored 24-hour average PM_{10} concentrations at either of the monitors exceeded the federal standard. The state 24-hour average PM_{10} standard was exceeded on 125 days out of 264 complete days at the landfill monitor and 38 days out of 182 complete days at the school monitor. Figures 3-13 and 3-14 present frequency distributions of the 24-hour average PM_{10} concentrations at the two monitoring sites. The fraction of the 24-hour periods (during which monitoring data was collected) in exceedance of the state 24-hour PM_{10} standard was 21% at the school monitor and 47% at the landfill monitor. The annual average PM_{10} concentrations measured at the school and landfill monitors were below the federal annual average standard. The state annual average standard was exceeded at both monitors.

3.3.4.2 Comparison with Other Regional Monitoring Data

PM_{10} monitoring data is collected from a network of 18 air monitors around the South Coast Air Basin by the SCAQMD once every sixth day. Data collected at all of these SCAQMD monitors were compared to the school 24-hour average PM_{10} monitoring results. It should be noted that one of these 18 monitors (El Toro) did not have data available on the California Air Resources on-line database for the monitoring period. Therefore, only 17 monitors were considered in this comparison. The school monitor, which measured concentrations continually rather than once every sixth day, recorded 182

[21] Standard deviation is a measure of how widely data vary from the average value of the data.
[22] Confidence interval is the range of data on either side of the average of the data.

24-hour PM_{10} concentration averages. Of these, 38 were in excess of the state standard of 50 $\mu g/m^3$, for an exceedance rate of 21%. If we compare the data from only the days that coincide with the SCAQMD monitors' sixth day sampling schedule, the school monitor recorded seven exceedances out of 29 days, or a 24% exceedance rate. This compares to the range of exceedance rates for the other 17 SCAQMD monitors of 5% to 67%. The average exceedance rate at the 16 SCAQMD monitors was 27%. A comparison of the exceedance rate for the school monitor with the other regional monitors is shown graphically in Figure 3-15. Annual average PM_{10} concentrations were calculated as mean of 24-hour average concentrations for days that coincide with the SCAQMD monitors' sixth day sampling schedule. Based on this analysis the annual average PM_{10} concentration at the school monitor was 35.2 $\mu g/m^3$. This compares to the range of annual average PM_{10} concentrations for the other 17 regional monitors of 28.5 $\mu g/m^3$ to 55.6 $\mu g/m^3$. The average annual average PM_{10} concentration at the 16 SCAQMD monitors was 39.4 $\mu g/m^3$. Figure 3-16 presents a graphical comparison of the annual average PM_{10} concentration for the school monitor with the other regional monitors. Details on the comparison of the school monitor PM_{10} concentrations to other regional monitoring data are presented in Appendix C.

3.4 Black Carbon Sampling Results

This section of the report presents a description of the black carbon sampling results to determine impacts from diesel exhaust emissions. The sampling period, completeness, and statistics are described in addition to an evaluation of data at certain times of the day that characterize landfill operations and rush hours. As there are no state or federal standards for black carbon, no comparison with standards is made in this section.

3.4.1 Sampling Period

Between November 22, 2001 and November 21, 2002, a total of 4,602 hours of validated black carbon monitoring data was collected at both the landfill and school monitors. This represents 53% of the total number of hours during this time period. The landfill monitor captured valid data 74% of the time and the school monitor captured valid data 71% of the time.

Table 3-4 presents the 1-hour average black carbon concentrations and average wind speeds for each monitor as a function of wind direction, as well as the percent occurrence of each wind direction category. Results are presented for the full set of monitoring data as well as for the two data subsets described in Section 3.1. As noted in Section 3.1, data were included in the 1-hour average black carbon concentrations calculations only if validated data for that hour exist for both monitoring sites.

Black carbon data and meteorological data for the landfill monitor was either not recorded or was not valid for 2,278 hours, or 26% of the hours between November 22, 2001 and November 21, 2002. There were nine periods of missing data that exceeded 24 hours. Reasons for the data gaps include power outages, meteorological equipment failure, the trailer losing its footing, and failure of the black carbon sensor. The data gaps and the reasons for these data gaps are summarized in Table 3-5 and range from 62 hours to 422 hours. Data gaps of less than 24 hours typically result from the exclusion of data due to failure of the validation rules summarized in Appendix B; these shorter data gaps account for 1.1% of the monitoring period. The "evening rush hours" and "landfill operating, non-rush hours" data subsets did not have validated data 25% and 26%, respectively, of the time.

Black carbon data for the school monitor was either not recorded or was not valid for 2,513 hours, or 29% of the hours between November 22, 2001 and November 21, 2002. There were six periods of missing data that exceeded 24 hours. Reasons for these data gaps include power outages, failure of the meteorological monitor, failure of the black carbon sensor, and incorrect flow rates. The data gaps and the reasons for these data gaps are summarized in Table 3-5 and range from 88 hours to 689 hours. Data gaps of less than 24 hours typically result from the exclusion of data due to failure of the validation rules summarized in Appendix B; these shorter data gaps account for 0.5% of the monitoring period. Both the "evening rush hours" and "landfill operating, non-rush hours" data subsets did not have validated data 28% of the time.

3.4.2 Analysis of 1-Hour Black Carbon Concentrations with Respect to Source Sectors

Average 1-hour black carbon concentrations were analyzed for a variety of conditions. The results of that analysis are summarized in Table 3-4 and discussed in this section. For hours that do not have calm winds, the overall average 1-hour black carbon concentration at the school monitor[23] was 1.08 $\mu g/m^3$. Overall, the average 1-hour black carbon concentration at the school monitor when the wind was determined to be from the landfill (as measured by the meteorological monitor at the school) was less than when the wind was coming from the freeway or from "other" (non-landfill sectors). The average 1-hour black carbon concentration at the school monitor when the wind was coming from the landfill (as measured by the meteorological monitor at the school)[24] was 0.47 $\mu g/m^3$. The average 1-hour black carbon concentration at the school monitor when the wind was not coming from the landfill (as measured by the meteorological monitor at the school)[25] was 1.19 $\mu g/m^3$. The average 1-hour black carbon concentration at the school monitor when the wind was coming from the freeway (as measured by the meteorological monitor at the school)[26] was 1.17 $\mu g/m^3$. These results are presented graphically in Figure 3-17.

3.4.3 Comparison of Concentrations during Different Times of Day

As discussed for PM_{10}, there are two periods during the day that are useful to consider in evaluating the contribution of local sources: the evening rush hours (Monday through Friday from 3 p.m. to 7 p.m.) and the midday period (Monday through Friday from 10 a.m. to 2 p.m. and Saturday from 6 a.m. to 12 p.m.). During the midday period (during which the landfill is operating) there would be diesel trucks and other landfill equipment operating but traffic on the freeway would be relatively light. During the evening rush hours, landfill operations have largely ceased. Each of these periods is discussed in this section.

3.4.3.1 Landfill Operating, Non-Rush Hours

For the midday period when the landfill is operating and freeway traffic is relatively light, Table 3-4 shows that, during hours which do not have calm winds, the 1-hour average black carbon concentration measured at the school monitor[27] was 1.37 $\mu g/m^3$. During the hours for which the meteorological monitor at the school registered winds coming from

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[23] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("All Monitoring Data") for all hours excluding calms (weighted average of 0.45 $\mu g/m^3$, 1.07 $\mu g/m^3$, 1.07 $\mu g/m^3$, 0.56 $\mu g/m^3$, 1.21 $\mu g/m^3$, and 1.24 $\mu g/m^3$).

[24] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("All Monitoring Data") for hours when the wind direction was from the landfill at the school monitor (weighted average of 0.45 $\mu g/m^3$ and 0.56 $\mu g/m^3$).

[25] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("All Monitoring Data") for hours when the wind direction was not from the landfill at the school monitor (weighted average of 1.07 $\mu g/m^3$, 1.07 $\mu g/m^3$, 1.21 $\mu g/m^3$, and 1.24 $\mu g/m^3$).

[26] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("All Monitoring Data") for hours when the wind direction was from the freeway at the school monitor (weighted average of 1.07 $\mu g/m^3$ and 1.21 $\mu g/m^3$).

[27] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("Landfill Operating, Non-Rush Hours") for all hours excluding calm winds (weighted average of 0.61 $\mu g/m^3$, 1.47 $\mu g/m^3$, 0.96 $\mu g/m^3$, 0.54 $\mu g/m^3$, 1.70 $\mu g/m^3$, and 1.56 $\mu g/m^3$).

the landfill, the average 1-hour black carbon concentration at the school monitor[28] (0.59 $\mu g/m^3$) was lower than the average concentration for all wind directions. From Table 3-4, we note that 86% of the winds during this period of the day during the monitoring period came from a sector other than the landfill (as measured by the meteorological monitor at the school); during these hours, the average 1-hour black carbon concentration at the school monitor[29] was 1.49 $\mu g/m^3$. This is more than twice the average 1-hour concentration measured by the school monitor for winds coming from the direction of the landfill. The average 1-hour black carbon concentration at the landfill monitor during this same time period (when the winds were not coming from the landfill as measured by the meteorological monitor at the landfill)[30] was very similar, at 1.35 $\mu g/m^3$. Although the traffic during this period of the day is lighter than during rush hours, it is evident that the contribution of DPM from the freeway to the ambient concentrations of black carbon at the school monitor, as well as at the landfill monitor, is significant. The results of this analysis are presented graphically in Figure 3-18.

Figure 3-19 depicts the black carbon concentrations measured during landfill operating, non-rush hours by wind direction, as measured at the school monitor, using a concentration rose. As noted in earlier sections, the length of each petal on the rose is proportional to the amount of time that wind is blowing from the direction of the petal. The colors of the petals signify concentrations as shown on the key to the figure. The black petals represent average concentrations above 1.4 $\mu g/m^3$. As Figure 3-19 illustrates, only the winds from the east-northeast through south have average concentrations above 1.4 $\mu g/m^3$. The wind rose for this time period can be found in Figure 3-20. Similar to the trend observed for PM_{10} concentrations, the highest concentrations of black carbon were from the sectors with the lowest wind speeds.

3.4.3.2 Evening Rush Hours

During the evening rush hours of Monday through Friday between 3 p.m. to 7 p.m., the landfill operations have generally ceased and freeway traffic is heavy. Table 3-4 shows

[28] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("Landfill Operating, Non-Rush Hours") for hours when the wind direction was from the landfill at the school monitor (weighted average of 0.61 $\mu g/m^3$ and 0.54 $\mu g/m^3$).
[29] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("Landfill Operating, Non-Rush Hours") for hours when the wind direction was not from the landfill at the school monitor (weighted average of 1.47 $\mu g/m^3$, 0.96 $\mu g/m^3$, 1.70 $\mu g/m^3$, and 1.56 $\mu g/m^3$).
[30] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("Landfill Operating, Non-Rush Hours") for hours when the wind direction was not from the landfill at the landfill monitor (weighted average of 0.67 $\mu g/m^3$, 1.81 $\mu g/m^3$, and 1.35 $\mu g/m^3$).

that the 1-hour average black carbon concentration at the school monitor[31] was 1.14 μg/m^3 (not including calm hours). The hours for which the meteorological monitor at the school measured winds coming from the landfill had an average 1-hour black carbon concentration at the school monitor[32] (0.40 μg/m^3) that was lower than the average concentration for all wind directions. Table 3-4 shows that approximately 89% of the winds during this period of the day came from a non-landfill sector (as measured by the meteorological monitor at the school); during these hours, the average 1-hour black carbon concentration at the school monitor[33] was 1.23 μg/m^3. This is higher than the average 1-hour black carbon concentration measured at the school monitor during evening rush hours for all wind directions (1.14 μg/m^3). The average 1-hour black carbon concentration at the landfill monitor during hours with winds coming from non-landfill sectors (as measured by the meteorological monitor at the landfill)[34] was 1.07 μg/m^3. The results of this analysis are shown graphically in Figure 3-21. These results suggest that the local black carbon concentrations result largely from regional sources.

Figure 3-22 depicts the black carbon concentrations measured between 3 p.m. and 7 p.m. (evening rush hours) by wind direction, as measured at the school monitor, using a concentration rose. As noted in earlier sections, the length of each petal on the rose is proportional to the amount of time that wind is blowing from the direction of the petal. The colors of the petals signify concentrations as shown on the key to the figure. The black petals represent average concentrations above 1.4 μg/m^3. The highest concentrations occurred predominantly during hours when the winds were coming from the south-southeast through east-southeast. Figure 3-23 depicts the wind rose for these same hours. Similar to the trend observed for PM_{10} concentrations, higher black carbon concentrations correspond to sectors where there were lower wind speeds.

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[31] This is a weighted average of the average 1-hour concentration listed in Table 3-2 ("Evening Rush Hours") for all hours excluding calm winds (weighted average of 0.40 μg/m^3, 1.10 μg/m^3, 0.55 μg/m^3, 0.39 μg/m^3, 1.20 μg/m^3, and 1.26 μg/m^3).

[32] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("Evening Rush Hours") for hours when the wind direction was from the landfill at the school monitor (weighted average of 0.40 μg/m^3 and 0.39 μg/m^3).

[33] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("Evening Rush Hours") for hours when the wind direction was not from the landfill at the school monitor (weighted average of 1.10 μg/m^3, 0.55 μg/m^3, 1.20 μg/m^3, and 1.26 μg/m^3).

[34] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("Evening Rush Hours") for hours when the wind direction was not from the landfill at the landfill monitor (weighted average of 0.30 μg/m^3, 1.15 μg/m^3, and 1.09 μg/m^3).

3.4.3.3 Impact of High Black Carbon Concentrations at the Landfill on Black Carbon Concentrations at Van Gogh Elementary School

One issue of concern raised by the community has been whether high concentrations of black carbon at the landfill berm due to activities at the landfill would result in high concentrations at the school monitor. Figure 3-24 presents a scatter plot of the hourly black carbon concentrations measured at the school versus the concentrations measured at the landfill for the same hour. Similar to the results found for PM_{10}, the graph appears to have two distinct areas: (1) data points clustered around a straight line and (2) a scattering of data points (184 or 4%) which are characterized by high black carbon concentrations at the landfill monitor and relatively low black carbon concentrations at the school monitor (ratio of landfill concentration to school concentration is greater than 2 to 1). This indicates that when measured black carbon values were low to moderate, regional influences dominated and the measured values were similar. When high values were measured at the landfill monitor, high concentrations at the school monitor do not generally result.

3.4.4 Analysis of 24-Hour Average Concentrations

Twenty-four hour black carbon concentration averages were calculated from hourly data for days with at least 18 hourly averages. The maximum 24-hour average black carbon concentrations at the school and landfill monitors were 3.72 $\mu g/m^3$ and 3.49 $\mu g/m^3$, respectively. The average 24-hour black carbon concentration at the school monitor was 0.98 $\mu g/m^3$, with a standard deviation of 0.67 $\mu g/m^3$. The 90% confidence interval was 0.92 $\mu g/m^3$ to 1.05 $\mu g/m^3$. The average 24-hour black carbon concentration at the landfill monitor was 0.99 $\mu g/m^3$ with a standard deviation of 0.57 $\mu g/m^3$. The 90% confidence interval was 0.93 $\mu g/m^3$ to 1.05 $\mu g/m^3$. This is shown graphically in Figure 3-25.

3.4.4.1 Comparison with Other Regional Monitoring Data

Elemental carbon monitoring data has been collected as part of two studies in southern California, the Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-II) and the Southern California Children's Health Study (CHS). A summary of the comparison of the school monitor black carbon concentrations to other regional monitoring data are presented below. Details of this comparison are presented in Appendix D.

As part of MATES-II, samples were collected from a network of eight air monitors around the South Coast Air Basin by the SCAQMD once every sixth day for the one year period from April 1998 to March 1999. Data collected at these monitors were compared to the school 24-hour average black carbon monitoring results. The 24-hour average black carbon concentration at the school monitor was 0.98 $\mu g/m^3$. This compares to the range of 24-hour average black carbon concentrations for the eight MATES-II regional monitors of 2.30 $\mu g/m^3$ to 4.53 $\mu g/m^3$. Figure 3-26 presents a graphical comparison of the 24-hour average black carbon concentrations for the school monitor and the MATES-II monitors.

Two-week samples were collected from a network of 13 air monitors located throughout southern California as part of the CHS. Four of these monitors are located outside of the South Coast Air Basin; therefore, these monitors were not included in this evaluation. In addition, data was not collected at one of the monitors located in the South Coast Air Basin in 1998, the most recent year of available data. Data collected in 1998 at the remaining eight monitors were compared to the school two-week average black carbon monitoring results. The two-week average black carbon concentration at the school monitor was 0.94 $\mu g/m^3$. This compares to the range of two-week average black carbon concentrations for the eight CHS regional monitors of 0.26 $\mu g/m^3$ to 1.08 $\mu g/m^3$. Figure 3-27 presents a graphical comparison of the two-week average black carbon concentrations for the school monitor and the CHS monitors.

4.0 CONCLUSIONS

4.1 PM_{10} Monitoring Results

Potential sources of PM_{10} emissions in the vicinity of the school monitor include the Sunshine Canyon Landfill, the freeway, and the nearby urban areas (see Figure 3-2). Concentrations of PM_{10} at the school monitor would be, in part, a function of the emissions from each of these potential sources, as well as of the prevailing wind speed and wind direction. Table 3-2 and Figures 3-3, 3-4, and 3-7 summarize the average 1-hour PM_{10} concentrations by wind direction and wind speed. The ambient concentrations evaluated in this analysis were measured from November 22, 2001 through November 21, 2002. Overall, the average 1-hour concentration at the school monitor when the wind was determined to come from the landfill (as measured by the meteorological monitor at the school) was less than when the wind was coming from the freeway or from the "other" (non-landfill) sectors. The average 1-hour PM_{10} concentration at the school monitor when the wind was coming from the landfill (as measured by the meteorological monitor at the school)[35] was 20.1 μg/m^3. The average 1-hour PM_{10} concentration at the school when the wind was not coming from the landfill (as measured by the meteorological monitor at the school)[36] was 38.0 μg/m^3.

The measured data was also evaluated according to the time of the day (rush hours and non-rush hours, landfill operations) and the direction of the wind (from the landfill, from the freeway, etc.). There are two important periods during the day that illustrate the relative contributions of the landfill and of the freeway to measured PM_{10} concentrations at the school monitor: evening rush hours (Monday through Friday from 3 p.m. to 7 p.m.) when the landfill operations have largely ceased and midday landfill operating hours (Monday through Friday from 10 a.m. to 2 p.m. and Saturday from 6 a.m. to 12 p.m.) when there would be relatively light freeway traffic.

Evaluation of the hourly PM_{10} concentrations measured at the school and landfill monitors during these two periods of the day illustrates two main points: (1) the concentrations of PM_{10} at the school monitor are largely due to regional sources of particulates; and (2) the particulate concentrations measured at the school monitor do not appear to correlate with elevated particulate emissions at the landfill. In addition, the comparison of the 24-hour average PM_{10}

[35] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("All Monitoring Data") for when the wind direction was determined to be from the landfill at the school monitor (weighted average of 21.0 μg/m^3 and 17.5 μg/m^3).

[36] This is a weighted average of the average 1-hour PM_{10} concentrations listed in Table 3-2 ("All Monitoring Data") for when the wind direction was not from the landfill at the school monitor (weighted average of 30.2 μg/m^3, 30.5 μg/m^3, 41.8 μg/m^3, and 40.6 μg/m^3).

concentrations measured at the school monitor to concentrations measured at 17 other regional monitors in the SCAQMD monitoring network indicated that the 16% exceedance rate of the state 24-hour PM_{10} standard at the school monitor was at the low end of the range of exceedance rates for the 17 regional monitors (7% to 72% exceedance rates).

4.2 Black Carbon Monitoring Results

The potential sources of diesel particulate matter (for which black carbon is a surrogate) in the vicinity of the school monitor include trucks at the Sunshine Canyon Landfill, local traffic, and freeway traffic. Table 3-4 and Figures 3-17, 3-18, and 3-21 summarize the average 1-hour black carbon concentrations by wind direction and wind speed. Overall, the average 1-hour black carbon concentration at the school monitor, when the wind was determined to come from the landfill (as measured by the meteorological monitor at the school), was less than when the wind was coming from the freeway or from the "other" (non-landfill) sectors. In considering all monitoring data, the average 1-hour black carbon concentration at the school monitor when the wind was coming from the landfill (as measured by the meteorological monitor at the school)[37] was 0.47 $\mu g/m^3$. The average 1-hour concentration at the school monitor when the wind was not coming from the landfill (as measured by the meteorological monitor at the school)[38] was 1.19 $\mu g/m^3$.

An analysis of the hourly black carbon monitoring data collected at the school and landfill monitors illustrates that, similar to the PM_{10} monitoring results, hourly black carbon concentrations at the school monitor appear to be dominated by the freeway sources.

4.3 Summary

In conclusion, the data collected at the Van Gogh Elementary School and the BFI Sunshine Canyon landfill from November 22, 2001 to November 21, 2002 appear to indicate that the freeway is a significant contributor to the regional PM_{10} and DPM (black carbon as surrogate) concentrations. Furthermore, it was observed that elevated concentrations of particulates, either PM_{10} or black carbon, at the landfill monitor do not necessarily lead to elevated concentrations at the school monitor.

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[37] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("All Monitoring Data") for when the wind direction was determined to be from the landfill at the school monitor (weighted average of 0.45 $\mu g/m^3$ and 0.56 $\mu g/m^3$).

[38] This is a weighted average of the average 1-hour black carbon concentrations listed in Table 3-4 ("All Monitoring Data") for when the wind direction was not from the landfill at the school monitor (weighted average of 1.07 $\mu g/m^3$, 1.07 $\mu g/m^3$, 1.21 $\mu g/m^3$, and 1.24 $\mu g/m^3$).

TABLES

Table ES-1
Federal and State PM_{10} Standards and Monitoring Exceedances
Browning-Ferris Industries of California, Inc.
Los Angeles, California

Regulatory Level	Averaging Period	PM_{10} Standard	Exceedances	
			School Monitor	Landfill Monitor
Federal	24 hours	150 $\mu g/m^3$	0	0
	Annual[1]	50 $\mu g/m^3$	No	No
State	24 hours	50 $\mu g/m^3$	38/182	125/264
	Annual[1]	20 $\mu g/m^3$	Yes	Yes

Notes:
[1] Arithmetic annual average of data

Table 3-1
Data Analysis Subsets
Browning-Ferris Industries of California, Inc.
Los Angeles, California

Data Subset	Hours Included		
	Monday-Friday	Saturday	Sunday
Evening rush hours	3 p.m. to 7 p.m.	None	None
Landfill operating, non-rush hours	10 a.m. to 2 p.m.	6 a.m. to 12 p.m.	None

Table 3-2
Average 1-Hour PM_{10} Concentrations and Wind Speeds by Wind Direction
Browning-Ferris Industries of California, Inc.
Los Angeles, California

All Monitoring Data

Wind Direction		Average 1-hr Concentration (μg/m^3)		Average Wind Speed (m/s)		% of Occurrence
@ Landfill	@ School	@ Landfill	@ School	@ Landfill	@ School	
From Landfill	From Landfill	35.7	21.0	7.2	2.4	17%
From Landfill	From Fwy	37.0	30.2	4.0	1.1	2.3%
From Landfill	Other	36.1	30.5	4.1	1.5	17%
Not from Landfill	From Landfill	30.0	17.5	6.4	2.0	6.0%
Not from Landfill	From Fwy	44.1	41.8	2.2	1.1	4.9%
Not from Landfill	Other	45.4	40.6	1.9	1.3	49%
Calm	All	58.4	47.3	0.0	0.7	3.5%
All directions		41.4	34.2	3.4	1.5	100%

Evening Rush Hours

Wind Direction		Average 1-hr Concentration (μg/m^3)		Average Wind Speed (m/s)		% of Occurrence
@ Landfill	@ School	@ Landfill	@ School	@ Landfill	@ School	
From Landfill	From Landfill	26.2	12.8	7.3	2.6	14%
From Landfill	From Fwy	11.3	23.3	4.0	1.8	1.1%
From Landfill	Other	21.3	20.1	5.5	2.1	4.8%
Not from Landfill	From Landfill	39.4	25.8	8.5	2.3	5.9%
Not from Landfill	From Fwy	42.9	37.8	1.8	1.4	5.1%
Not from Landfill	Other	45.7	40.5	2.1	1.6	68%
Calm	All	20.0	27.3	0.0	0.6	0.8%
All directions		40.7	34.4	3.4	1.8	100%

Landfill Operating, Non-Rush Hours

Wind Direction		Average 1-hr Concentration (μg/m^3)		Average Wind Speed (m/s)		% of Occurrence
@ Landfill	@ School	@ Landfill	@ School	@ Landfill	@ School	
From Landfill	From Landfill	57.1	27.0	8.0	3.0	13.6%
From Landfill	From Fwy	40.5	30.6	3.1	1.2	3.5%
From Landfill	Other	42.1	36.4	5.7	2.4	11%
Not from Landfill	From Landfill	56.4	8.8	7.1	2.4	4.5%
Not from Landfill	From Fwy	40.8	35.1	2.2	1.2	5.7%
Not from Landfill	Other	50.4	43.8	2.0	1.5	61%
Calm	All	81.0	57.5	0.0	0.8	0.4%
All directions		49.9	38.3	3.5	1.8	100%

Table 3-3

PM_{10} Concentration Data Gaps Greater than 24 Hours

Browning-Ferris Industries of California, Inc.

Los Angeles, California

Monitor	Data Gap			
	Duration	Start Date/Time	End Date/Time	Explanation
Landfill monitor	323 hours	1/20/02, 2 a.m.	2/2/02, 12 p.m.	Wind speed values "stuck" at 0.2 m/s (sensor not working)
	422 hours	2/9/02, 12 a.m.	2/26/02, 1 p.m.	2/9/02 - 2/15/02: Trailer blown over (no data recorded) 2/16/02 - 2/26/02: Wind speed values "stuck" at 0.2 m/s (sensor not working)
	33 hours	2/27/02, 12 a.m.	2/28/02, 8 a.m.	Wind direction error
	203 hours	3/5/02, 1 p.m.	3/13/02, 11 p.m.	Power outage (no data recorded)
	407 hours	4/23/02, 1 p.m.	5/10/02, 11 a.m.	Concentration values "stuck"
	326 hours	5/23/02, 8 a.m.	6/5/02, 9 p.m.	5/23/02 - 5/27/02: Concentration values "stuck" 5/28/02 - 6/5/02: Power outage (no data recorded)
	474 hours	7/20/02, 8 p.m.	8/9/02, 1 p.m.	Concentration values "stuck"
	120 hours	11/17/02, 12 a.m.	11/21/02, 11 p.m.	Missing data
School monitor	184 hours	12/14/01, 12 a.m.	12/21/01, 3 p.m.	Concentration values "stuck"
	186 hours	2/4/02, 12 a.m.	2/11/02, 5 p.m.	Concentration values "stuck"
	818 hours	4/18/02, 7 p.m.	5/22/02, 8 p.m.	4/18/02 - 5/7/02: Concentration values "stuck" 5/8/02 - 5/22/02: Power outage (no data recorded)
	643 hours	5/29/02, 2 p.m.	6/25/02, 8 a.m.	Power outage (no data recorded)
	487 hours	7/14/02, 12 a.m.	8/3/02, 6 a.m.	Concentration values "stuck"
	235 hours	8/6/02, 4 p.m.	8/16/02, 10 a.m.	8/6/02, 4 p.m. - 8/8/02, 11:00 a.m.: Concentration values "stuck" 8/8/02, 12 p.m. - 8/16/02, 10:00 a.m.: Low or incorrect flow rate
	198 hours	8/21/02, 5 p.m.	8/29/02, 10 p.m.	Concentration values "stuck"
	267 hours	8/31/02, 2 p.m.	9/11/02, 4 p.m.	Concentration values "stuck"
	892 hours	9/17/02, 12 p.m.	10/24/02, 3 p.m.	9/17/02, 12 p.m. - 10/4/02, 6:00 p.m.: Low or incorrect flow rate 10/4/02, 7 p.m. - 10/8/02, 10:00 a.m.: Power outage (no data recorded) 10/8/02, 11 a.m. - 10/24/02, 3:00 p.m.: Low or incorrect flow rate

Table 3-4
Average 1-Hour Black Carbon Concentrations and Wind Speeds by Wind Direction
Browning-Ferris Industries of California, Inc.
Los Angeles, California

All Monitoring Data

Wind Direction		Average 1-hr Concentration (μg/m³)		Average Wind Speed (m/s)		% of Occurrence
@ Landfill	@ School	@ Landfill	@ School	@ Landfill	@ School	
From Landfill	From Landfill	0.46	0.45	6.7	2.1	12%
From Landfill	From Fwy	0.88	1.07	3.9	1.0	2.0%
From Landfill	Other	1.08	1.07	3.7	1.2	18%
Not from Landfill	From Landfill	0.56	0.56	5.9	1.9	3.4%
Not from Landfill	From Fwy	1.16	1.21	1.9	1.1	5.1%
Not from Landfill	Other	1.10	1.24	1.8	1.3	55%
Calm	All	1.17	1.26	0.0	0.6	4.5%
All directions		1.00	1.09	2.8	1.3	100%

Evening Rush Hours

Wind Direction		Average 1-hr Concentration (μg/m³)		Average Wind Speed (m/s)		% of Occurrence
@ Landfill	@ School	@ Landfill	@ School	@ Landfill	@ School	
From Landfill	From Landfill	0.45	0.40	6.4	2.2	8.0%
From Landfill	From Fwy	0.11	1.10	1.3	0.9	0.2%
From Landfill	Other	0.69	0.55	4.8	2.0	3.7%
Not from Landfill	From Landfill	0.30	0.39	9.0	2.6	2.5%
Not from Landfill	From Fwy	1.15	1.20	2.0	1.6	4.6%
Not from Landfill	Other	1.09	1.26	2.3	1.8	80%
Calm	All	1.31	1.37	0.0	0.6	0.7%
All directions		1.01	1.14	2.8	1.8	100%

Landfill Operating, Non-Rush Hours

Wind Direction		Average 1-hr Concentration (μg/m³)		Average Wind Speed (m/s)		% of Occurrence
@ Landfill	@ School	@ Landfill	@ School	@ Landfill	@ School	
From Landfill	From Landfill	0.59	0.61	6.6	2.3	10%
From Landfill	From Fwy	1.18	1.47	3.4	1.2	3.5%
From Landfill	Other	0.95	0.96	4.8	1.8	11%
Not from Landfill	From Landfill	0.67	0.54	6.2	2.2	3.2%
Not from Landfill	From Fwy	1.81	1.70	1.9	1.2	5.0%
Not from Landfill	Other	1.35	1.56	2.0	1.5	67%
Calm	All	1.33	1.45	0.0	0.8	0.3%
All directions		1.22	1.37	3.0	1.6	100%

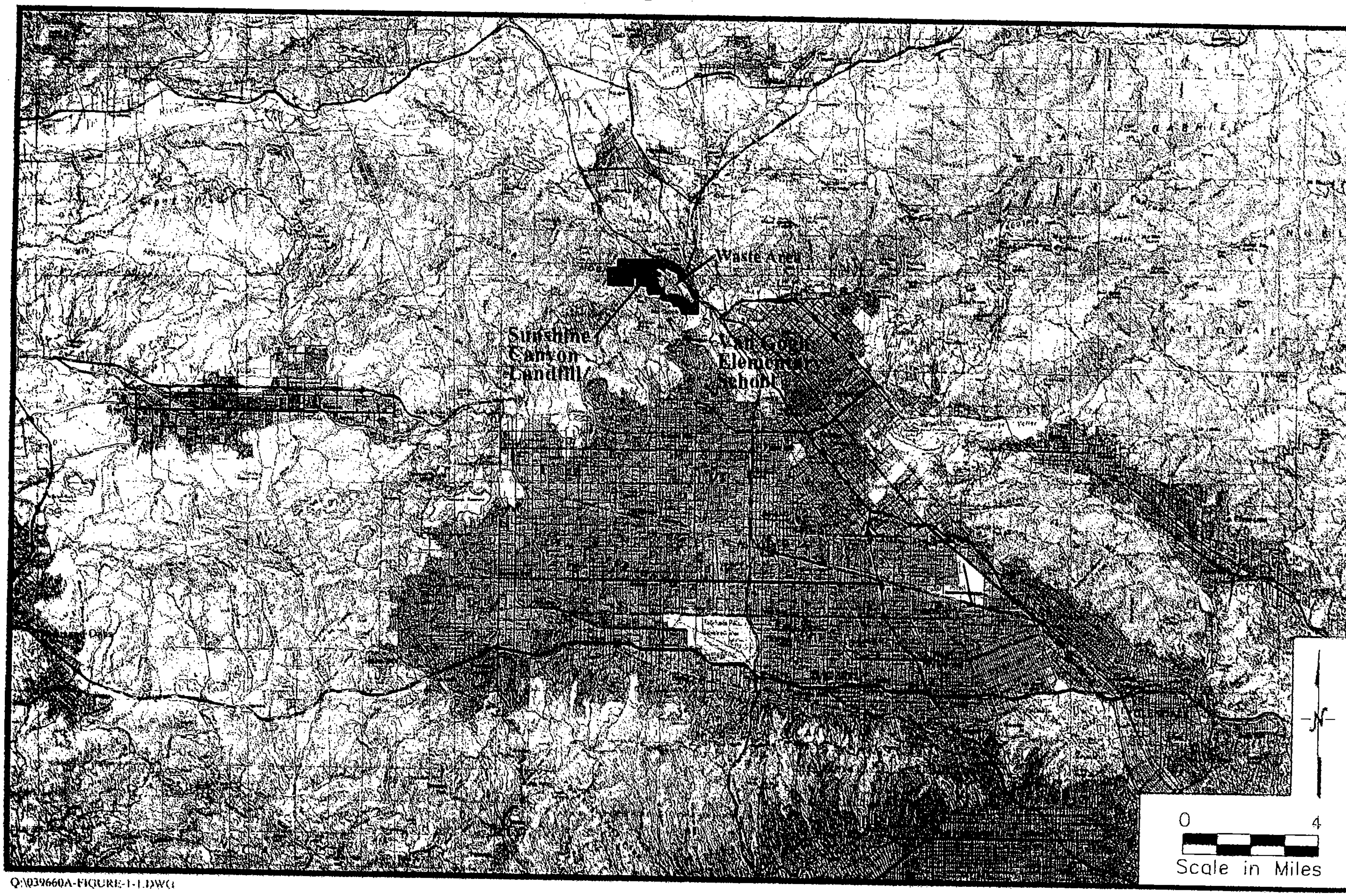
Table 3-5

Black Carbon Concentration Data Gaps Greater than 24 Hours
Browning-Ferris Industries of California, Inc.
Los Angeles, California

Monitor	Data Gap			
	Duration	Start Date/Time	End Date/Time	Explanation
Landfill monitor	122 hours	12/22/01, 7 p.m.	12/27/01, 8 a.m.	Power outage (no data recorded)
	276 hours	12/29/01, 1 a.m.	1/9/02, 12 p.m.	Power outage (no data recorded)
	323 hours	1/20/02, 2 a.m.	2/2/02, 12 p.m.	Wind speed values "stuck" at 0.2 m/s (sensor not working)
	422 hours	2/9/02, 12 a.m.	2/26/02, 1 p.m.	2/9/02: Trailer blown over (no data recorded)
				2/10/02 - 2/26/02: No data recorded or wind speed values "stuck" at 0.2 m/s (sensor not working)
	203 hours	3/5/02, 1 p.m.	3/13/02, 11 p.m.	Power outage (no data recorded)
	62 hours	4/1/02, 12 a.m.	4/3/02, 1 p.m.	Power outage (no data recorded)
	301 hours	5/24/02, 9 a.m.	6/5/02, 9 p.m.	5/24/02 - 5/28/02: Power outage (no data recorded)
				5/28/02 - 6/5/02: No meteorological data recorded
	135 hours	6/19/02, 6 p.m.	6/25/02, 8 a.m.	Power outage (no data recorded)
	338 hours	11/7/02, 10 p.m.	11/21/02, 11 p.m.	11/7/02, 10 p.m. - 11/17/02, 11:00 a.m.: Instrument failure (no data recorded)
				11/17/02, 12 p.m. - 11/21/02, 11:00 p.m.: No meteorological data recorded
School monitor	412 hours	3/17/02, 4 a.m.	4/3/02, 7 a.m.	Power outage (no data recorded)
	394 hours	5/8/02, 12 a.m.	5/24/02, 9 a.m.	5/8/02 - 5/16/02: No meteorological data recorded
				5/16/02 - 5/24/02: Power outage (no data recorded)
	658 hours	5/29/02, 2 p.m.	6/25/02, 11 p.m.	Power outage (no data recorded)
	689 hours	7/11/02, 5 p.m.	8/9/02, 9 a.m.	Equipment failure
	88 hours	10/4/02, 7 p.m.	10/8/02, 10 a.m.	No meteorological data recorded
	226 hours	11/8/02, 1 a.m.	11/17/02, 10 a.m.	11/8/02, 1 a.m. - 11/8/02, 9:00 a.m.: Flow problem
				11/8/02, 10 a.m. - 11/17/02, 10:00 a.m.: Missing data

FIGURES

Figure 1-1
Regional Map
Browning-Ferris Industries of California, Inc.
Los Angeles, California



Q:\039660A-FIGURE-1-1.DWG

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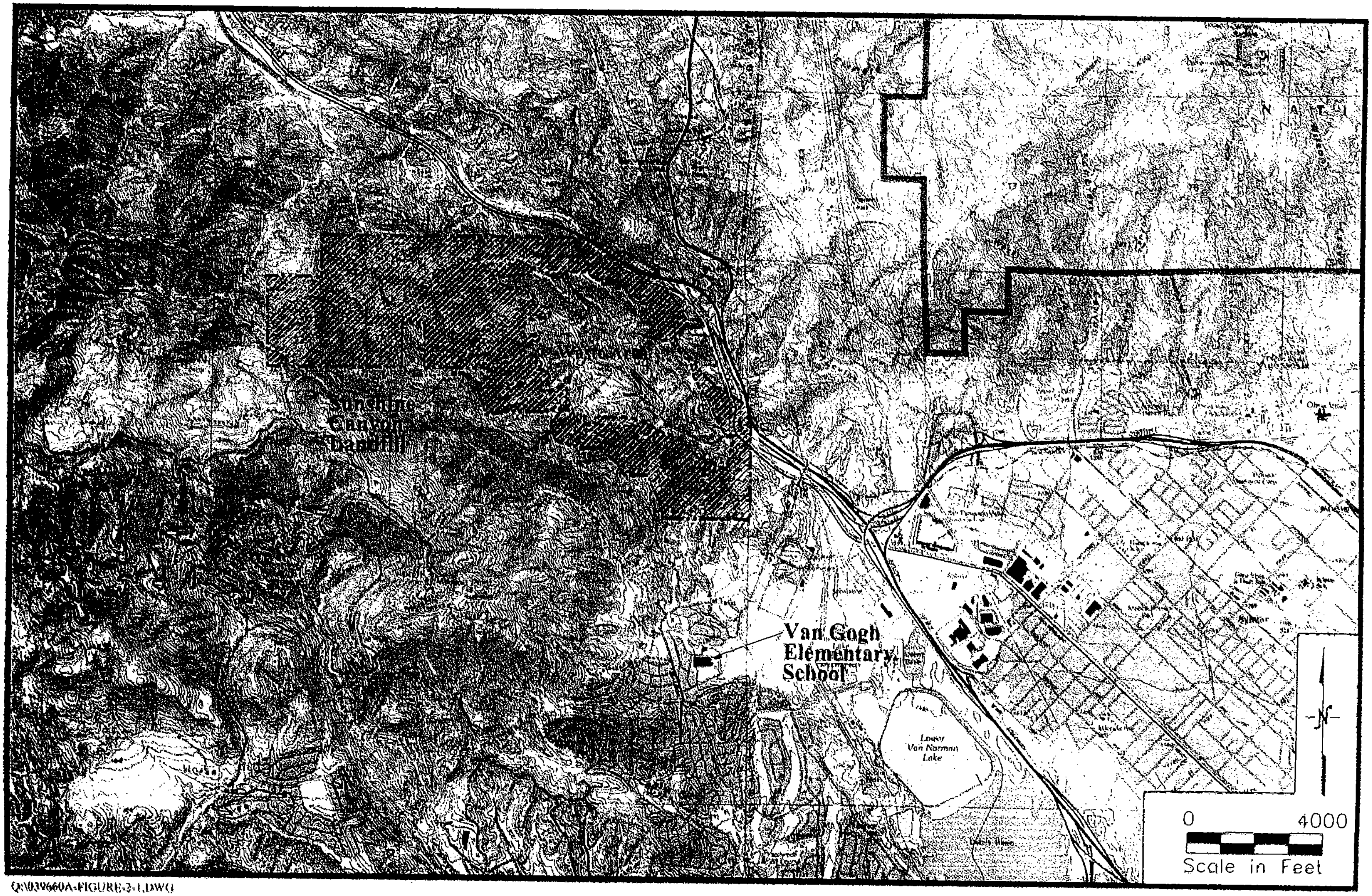
Figure 2-1
Location of Monitors
Browning-Ferris Industries of California, Inc.
Los Angeles, California



Q:\039660A-FIGURE-2-1.DWG

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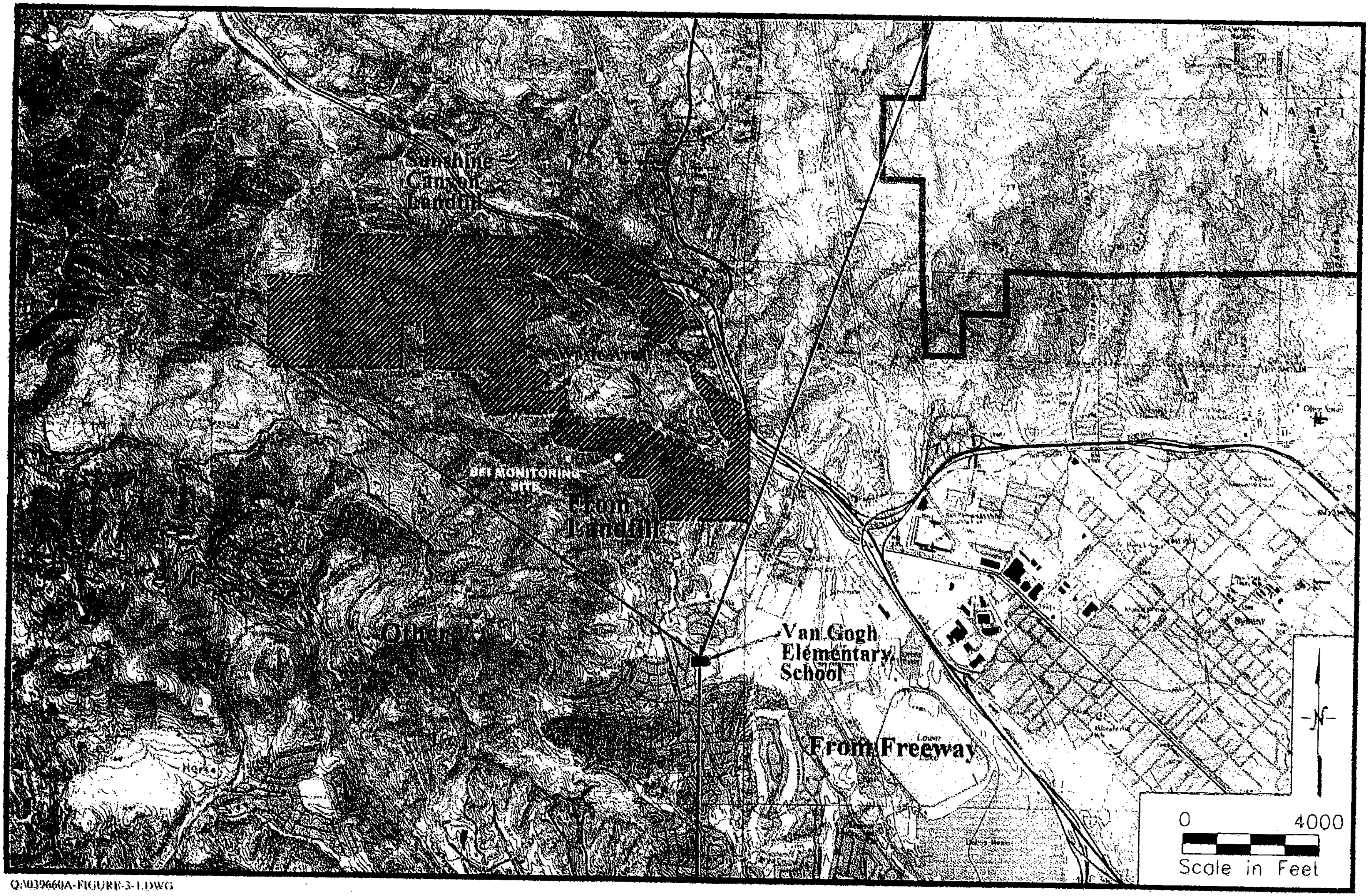
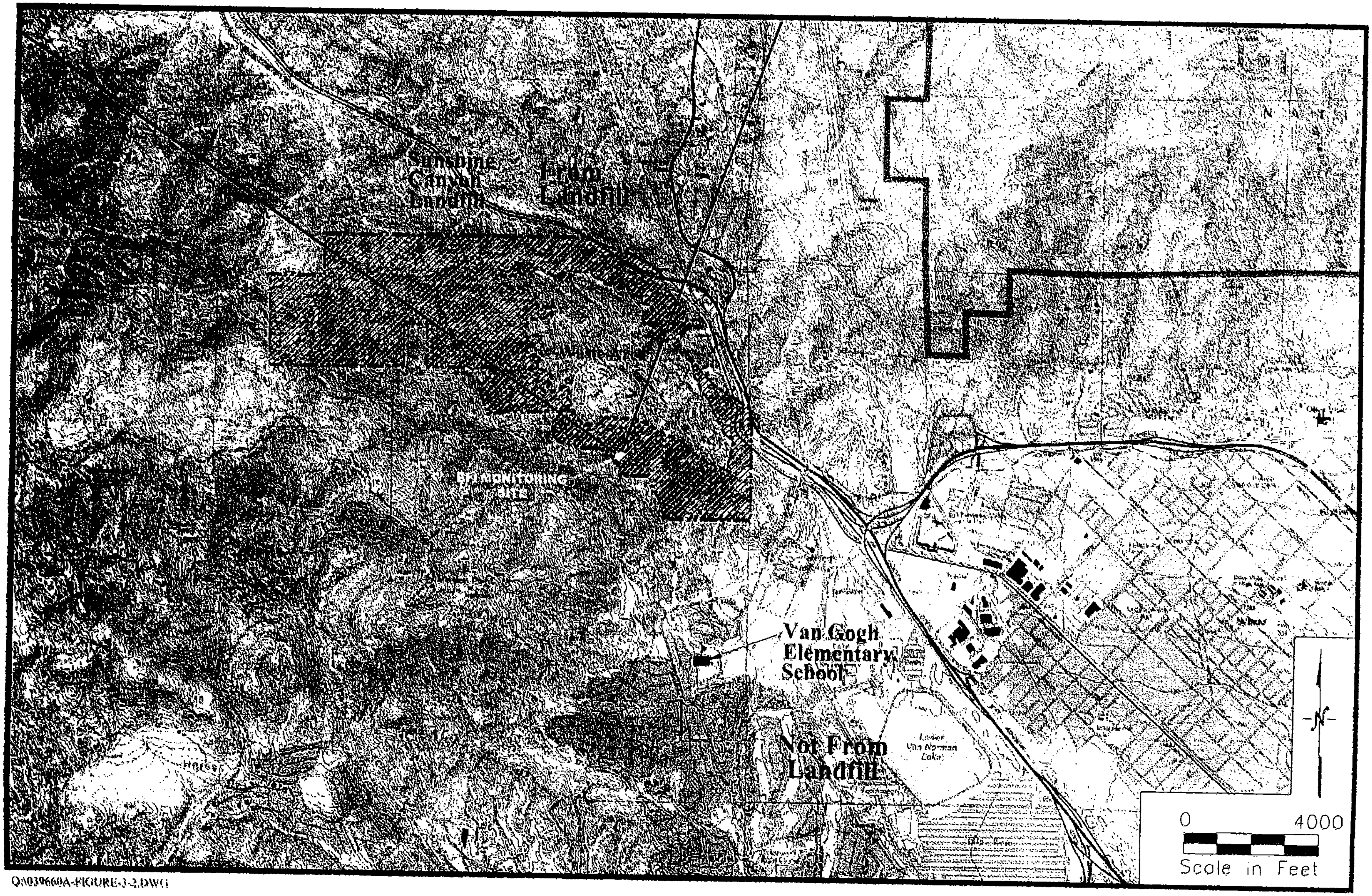
Figure 3-1
Wind Direction Categories for Van Gogh Elementary School
Browning-Ferris Industries of California, Inc.
Los Angeles, California



Q:\039660A-FIGURE-3-1.DWG

ENVIRON

Figure 3-2
Wind Direction Categories for Landfill Monitor
Browning-Ferris Industries of California, Inc.
Los Angeles, California



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APPENDIX D

REGIONAL BLACK CARBON MONITORING DATA ANALYSIS

Appendix D

Regional Black Carbon Air Monitoring Data Analysis

This appendix contains a description of the regional elemental (black) carbon monitoring conducted as part of the Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-II) and the Southern California Children's Health Study (CHS) that were analyzed for comparison with the measured data. This section also contains details on the methods used to compare the monitored ambient air concentrations.

D.1 MATES-II Monitoring Network

As part of MATES-II, the SCAQMD monitored toxic air contaminants, including elemental carbon, once every six days for the one year period from April 1998 to March 1999. Samples were collected from a network of eight air monitors around the South Coast Air Basin. All eight monitors were selected for comparison to the monitoring conducted at the school. These monitors are: the Burbank, Huntington Park, Los Angeles, North Long Beach, and Pico Rivera monitors in Los Angeles County, the Anaheim monitor in Orange County, the Rubidoux monitor in Riverside County, and the Fontana monitor in San Bernardino County. Figure D-1 depicts the locations of these monitors relative to the school monitor.

The MATES-II report includes the annual mean and standard deviation of the 24-hour average ambient elemental carbon concentration measurements. Table D-1 presents the number of 24-hour average measurements available for each monitor. This table also summarizes the 24-hour average concentration for each monitor. The 24-hour average black carbon concentration at the school monitor was 0.98 $\mu g/m^3$. This compares to the range of 24-hour average black carbon concentrations for the eight MATES-II regional monitors of 2.30 $\mu g/m^3$ to 4.53 $\mu g/m^3$. Therefore, the black carbon concentrations measured at the school monitor are lower than the concentrations measured at other monitors throughout the SCAQMD.

D.2 CHS Monitoring Network

As part of the CHS, two-week samples of elemental and organic carbon were collected from a network of 13 air monitors at various locations throughout Southern California from 1994 to 1998. Four of these monitors are located outside of the South Coast Air Basin; therefore, these monitors were not included in this evaluation. In addition, data was not collected at one of the monitors located within the South Coast Air Basin during 1998, the most recent year for which data is available. Data collected in 1998 at the remaining eight monitors were compared to the school two-week average black carbon monitoring results. These monitors are: the Glendora, Lancaster, and Long Beach monitors in Los Angeles County, the Lake Elsinore, Mira Loma, and Riverside monitors in Riverside County, and the Lake Arrowhead and Upland monitors in San Bernardino County. The CHS report includes the annual mean and standard deviation of the two-week average ambient elemental carbon concentration measurements.

Table D-2 presents the number of two-week average measurements available for each monitor. This table also summarizes the two-week average black carbon concentration for each monitor. The two-week average black carbon concentration at the school monitor was 0.94 $\mu g/m^3$. This compares to the range of two-week average black carbon concentrations for the eight CHS regional monitors of 0.26 $\mu g/m^3$ to 1.08 $\mu g/m^3$. Thus, the black carbon concentrations measured at the school monitor are within the range of concentrations measured at monitors throughout the South Coast Air Basin.

D.3 References

Salmon, L., K. Mertz, P. Mayo, and G. Cass. 2000. "Determination of Elemental Carbon, Organic Carbon, and Source Contributions to Atmospheric Particles during the Southern California Children's Health Study, Part A: Inorganic and Elemental Carbon Particle Concentrations during the Southern California Children's Health Study, 1994-1998." Environmental Engineering Science Department, California Institute of Technology. Report to California Air Resources Board and California Environmental Protection Agency, Contract Number 98-320. June.

South Coast Air Quality Management District (SCAQMD). 2000. *MATES-II, Multiple Air Toxics Exposure Study in the South Coast Air Basin*. March.

Figure 3-4

Average 1-Hour PM_{10} Concentrations by Wind Direction Sectors
Landfill Operating, Non-Rush Hours
Browning-Ferris Industries of California, Inc.
Los Angeles, California

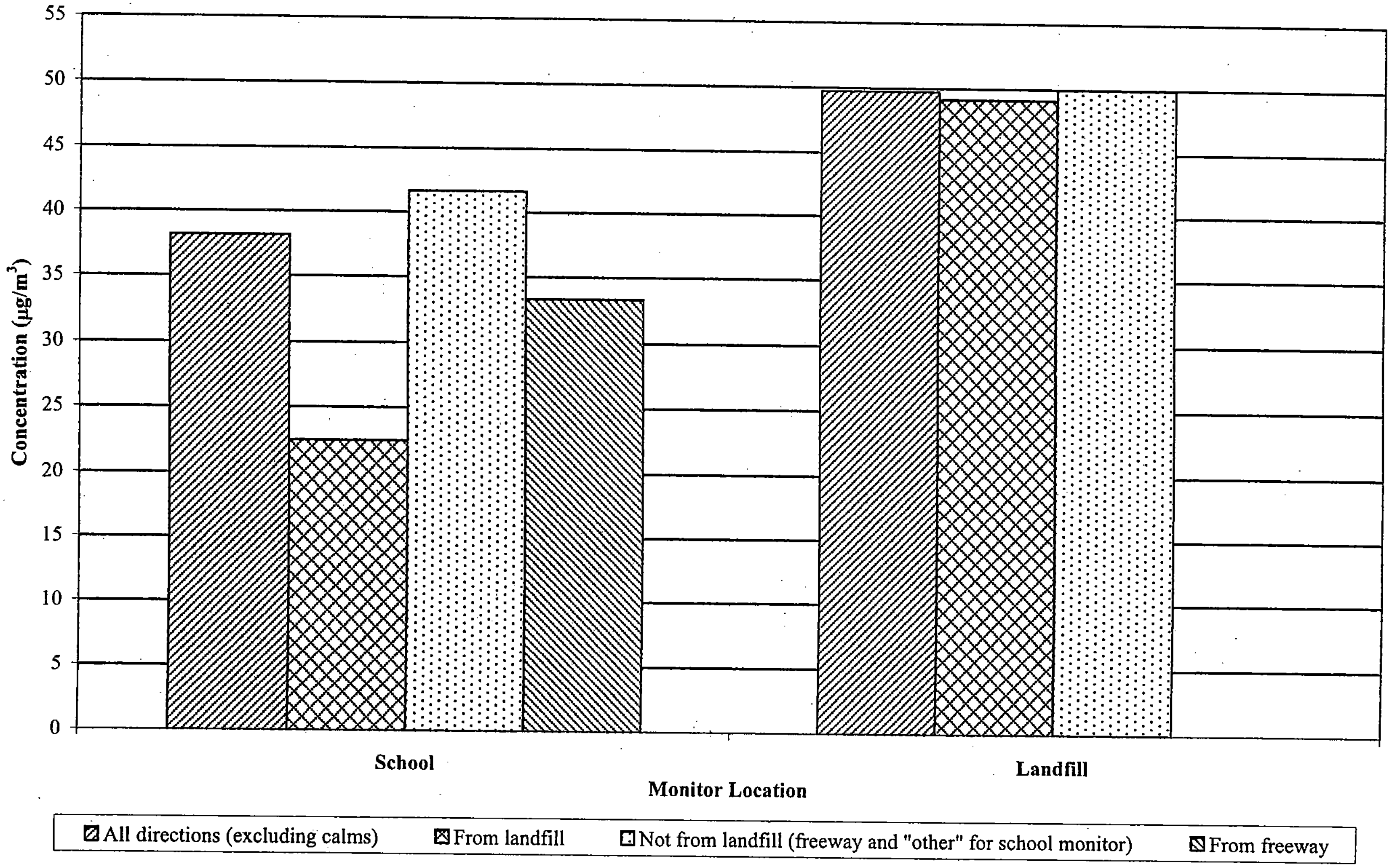


Figure 3-3
Average 1-Hour PM_{10} Concentrations by Wind Direction Sectors
All Monitoring Data
Browning-Ferris Industries of California, Inc.
Los Angeles, California

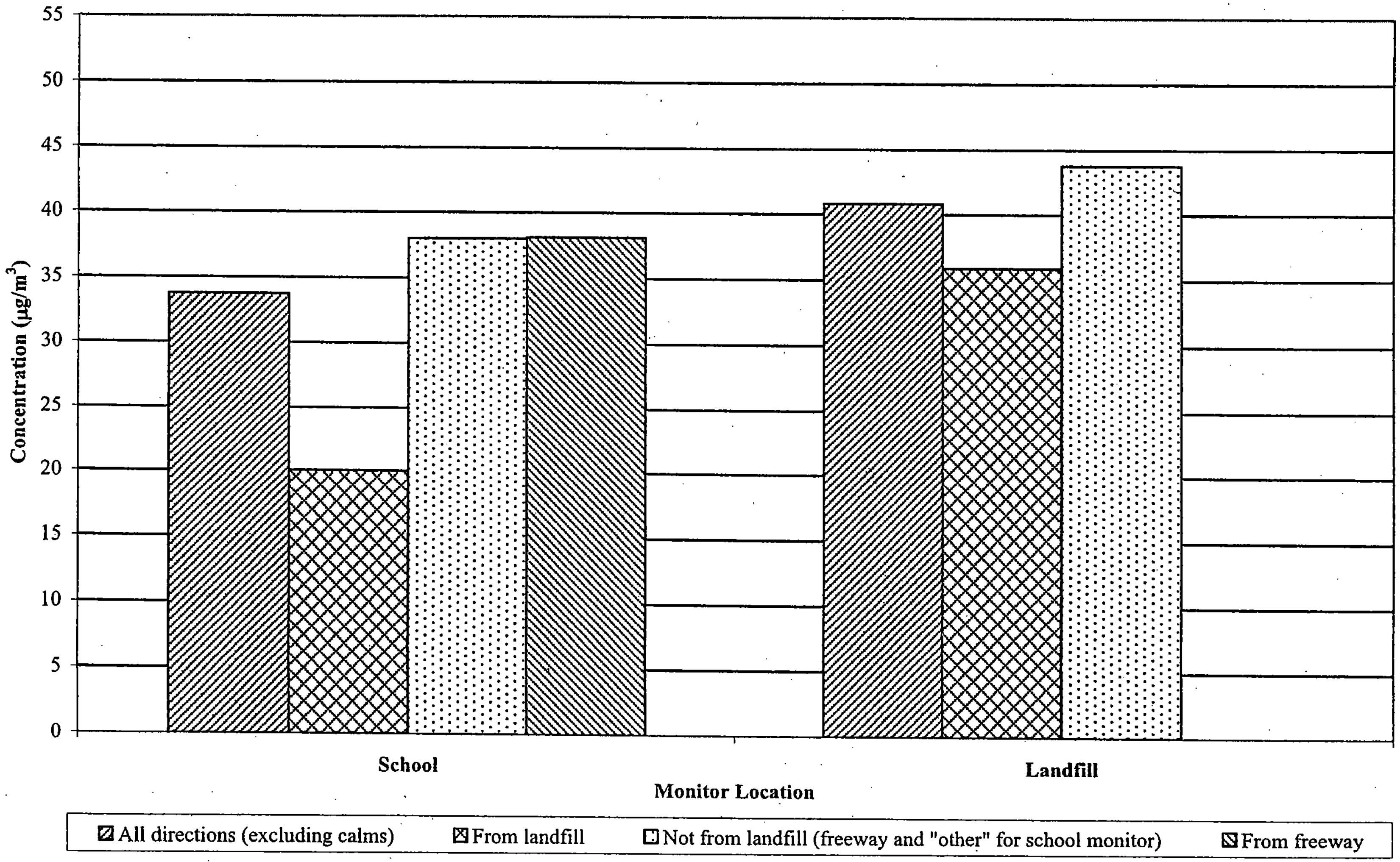
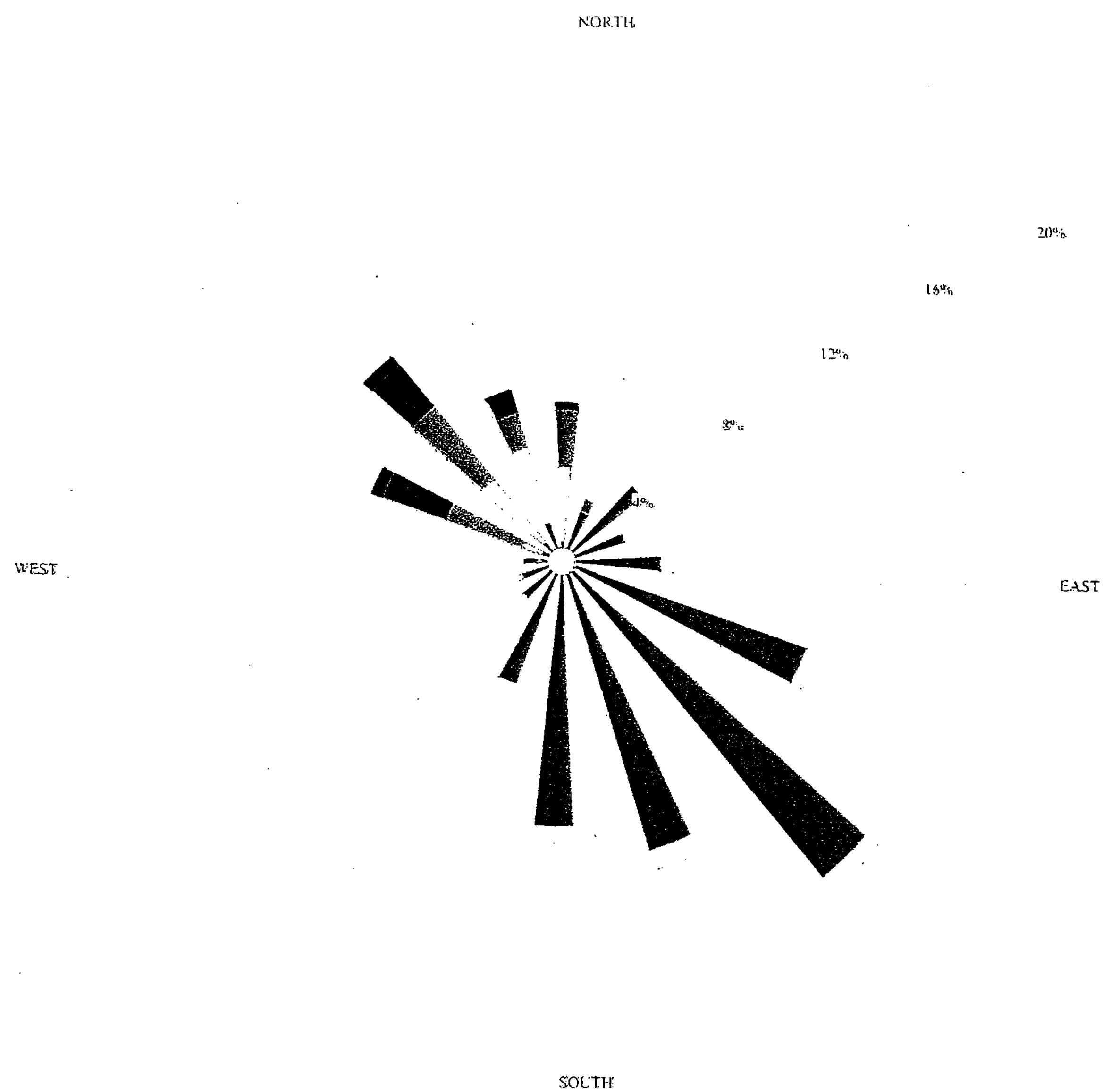


Figure 3-5 Wind Rose for School Monitor for PM_{10} Sampling during Non-Rush Landfill Operating Hours

(Monday through Friday, 10 a.m. to 2 p.m. and Saturday, 6 a.m. to 12 p.m.)



Wind Speed
(m/s)

- >= 5.0
- 4.0 - 5.0
- 3.0 - 4.0
- 2.0 - 3.0
- 1.0 - 2.0
- 0.0 - 1.0

TOTAL COUNT:
675 hours

AVG. WIND SPEED:
1.90 m/s

WRPLOT View - Lakes Environmental Software

Figure 3-6

PM_{10} Concentration Rose for School Monitor for Non-Rush Landfill Operating Hours

(Monday through Friday, 10 a.m. to 2 p.m. and Saturday, 6 a.m. to 12 p.m.)

Averaged by Wind Direction

Browning-Ferris Industries of California, Inc.

LosAngeles, California

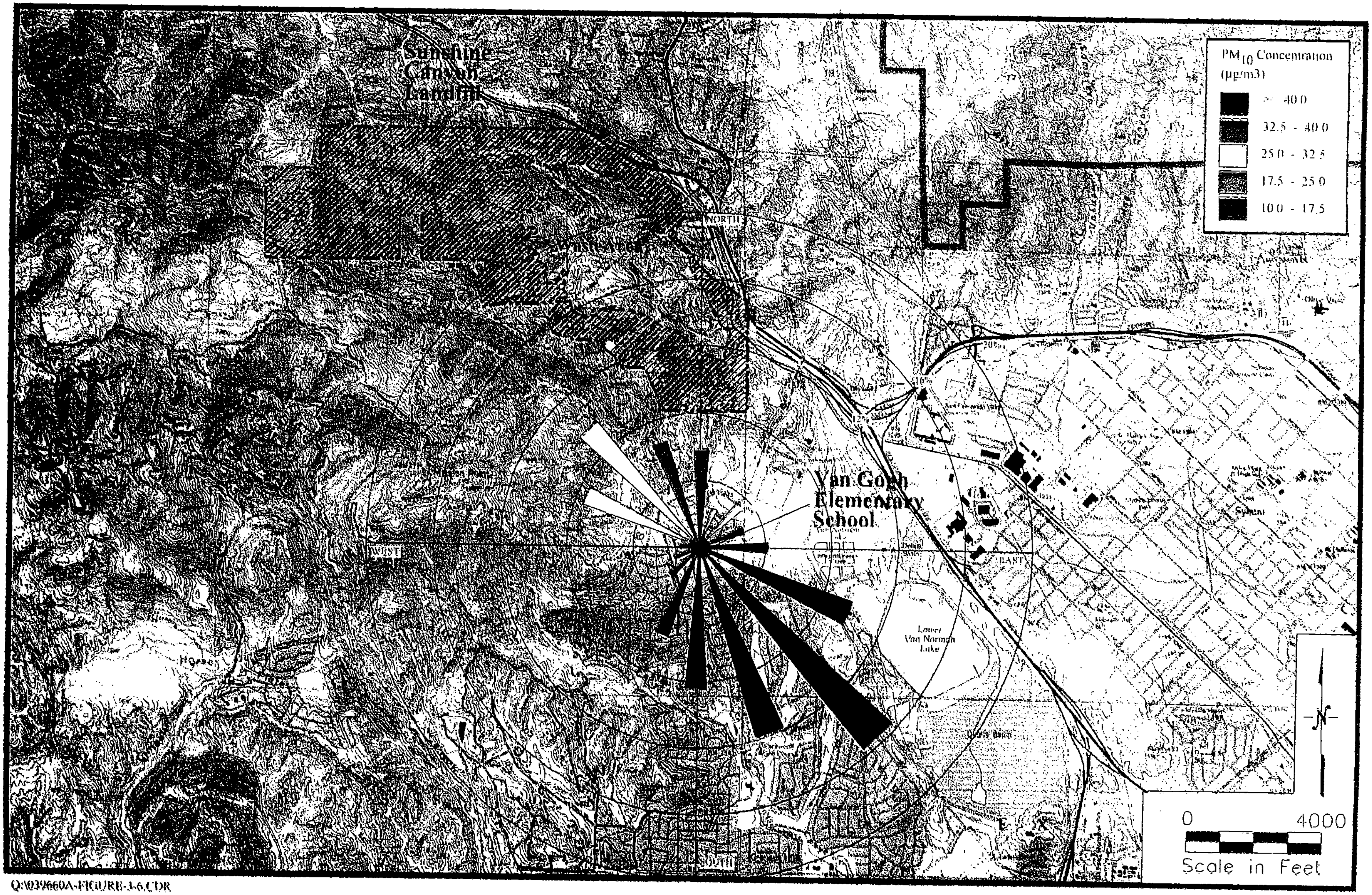


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Figure 3-7
Average 1-Hour PM_{10} Concentrations by Wind Direction Sectors
Evening Rush Hours
Browning-Ferris Industries of California, Inc.
Los Angeles, California

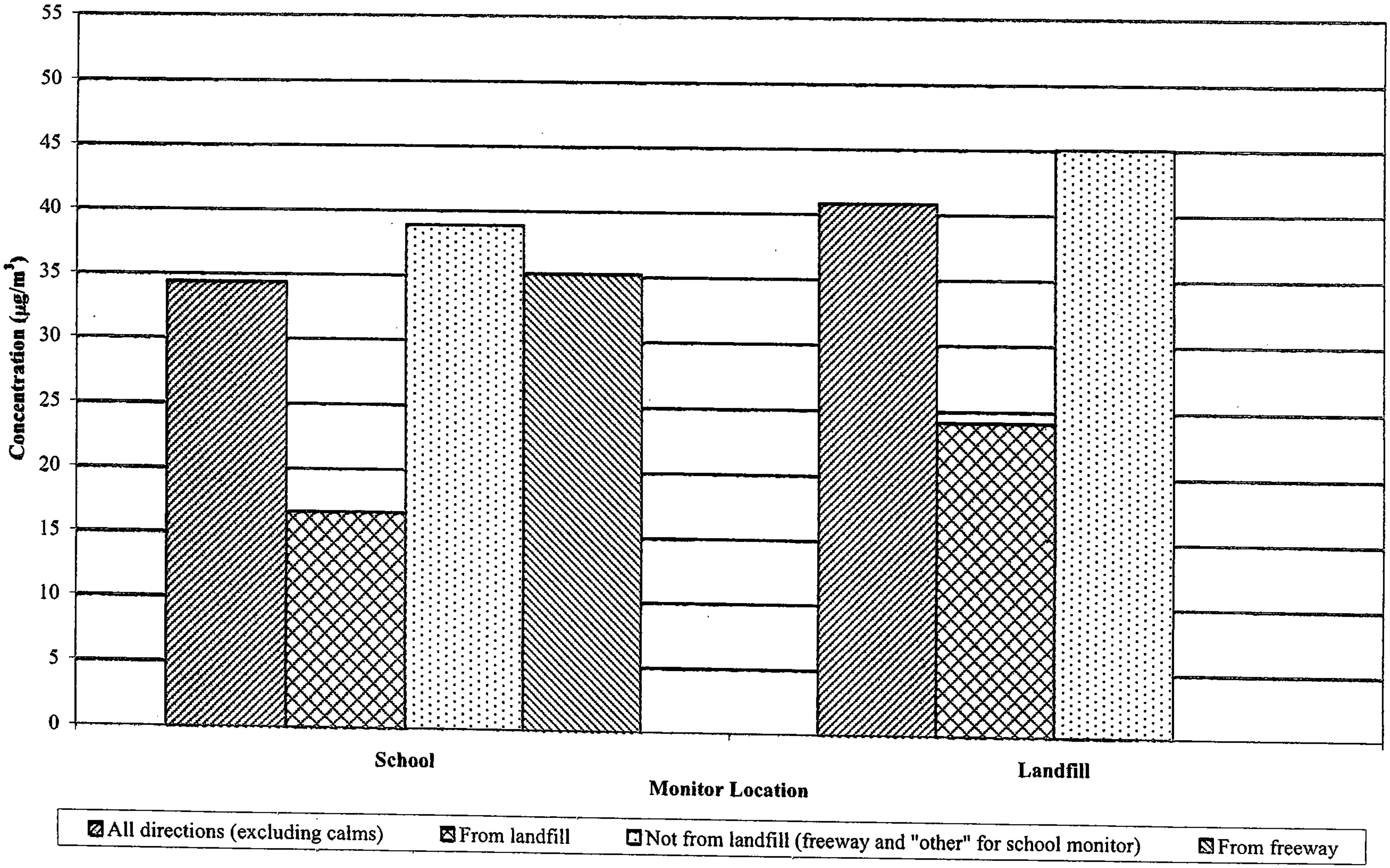

Figure 3-8 Wind Rose for School Monitor for PM_{10} Sampling during Evening Rush Hours (Monday through Friday, 3 p.m. to 7 p.m.)

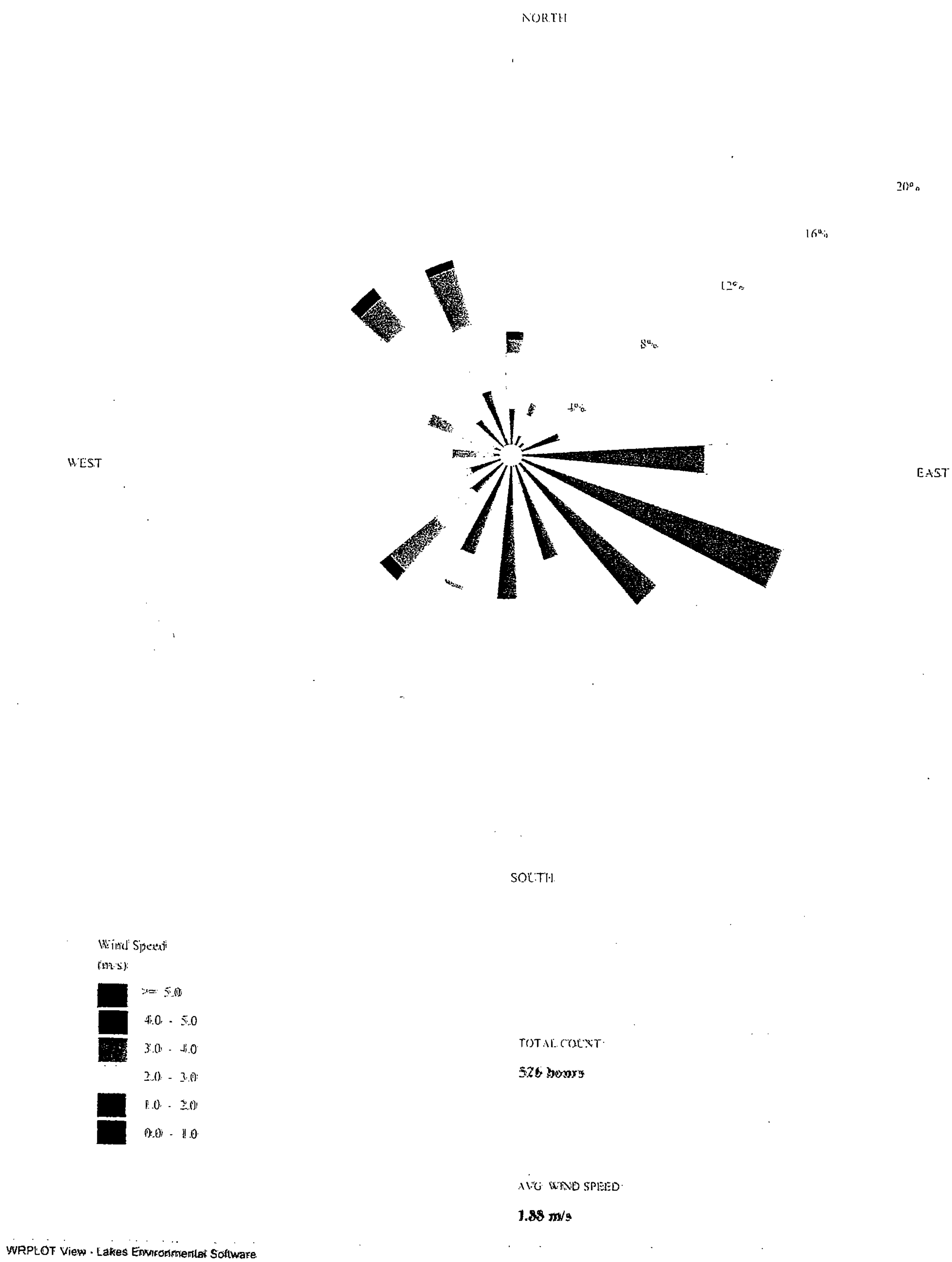

Figure 3-9
PM_{10} Concentration Rose for School Monitor for Evening Rush Hours
(Monday through Friday, 3 p.m. to 7 p.m.)
Averaged by Wind Direction
Browning-Ferris Industries of California, Inc.
LosAngeles, California

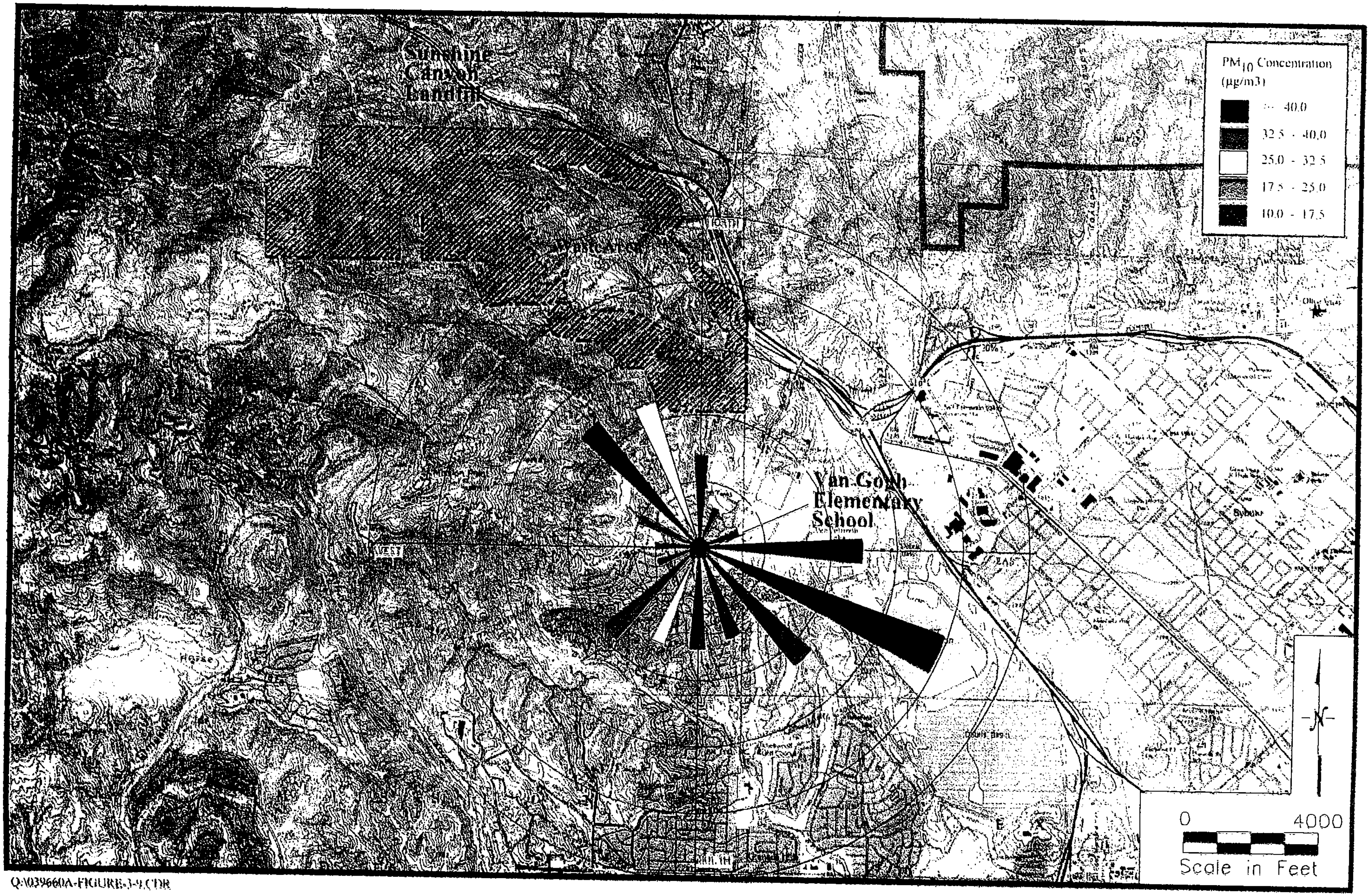

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Figure 3-10
Scatter Plot of Hourly PM_{10} Concentrations at School and Landfill Monitors
Browning-Ferris Industries of California, Inc.
Los Angeles, California

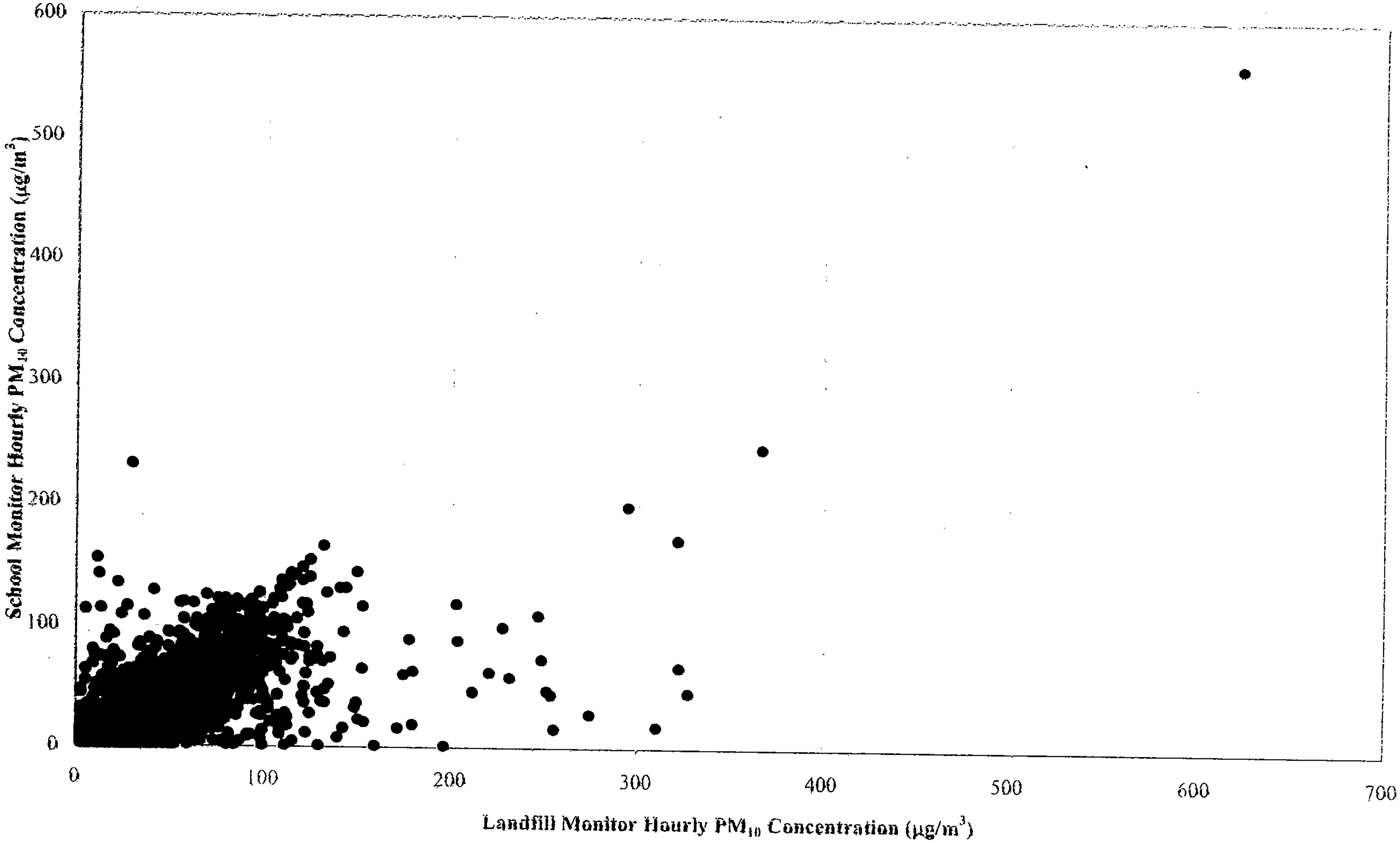

Figure 3-11
Scatter Plot of Hourly PM_{10} Concentration at School and Landfill Monitors
(For hours where the concentration at school monitor <100 µg/m3)
Browning-Ferris Industries of California, Inc.
LosAngeles, California

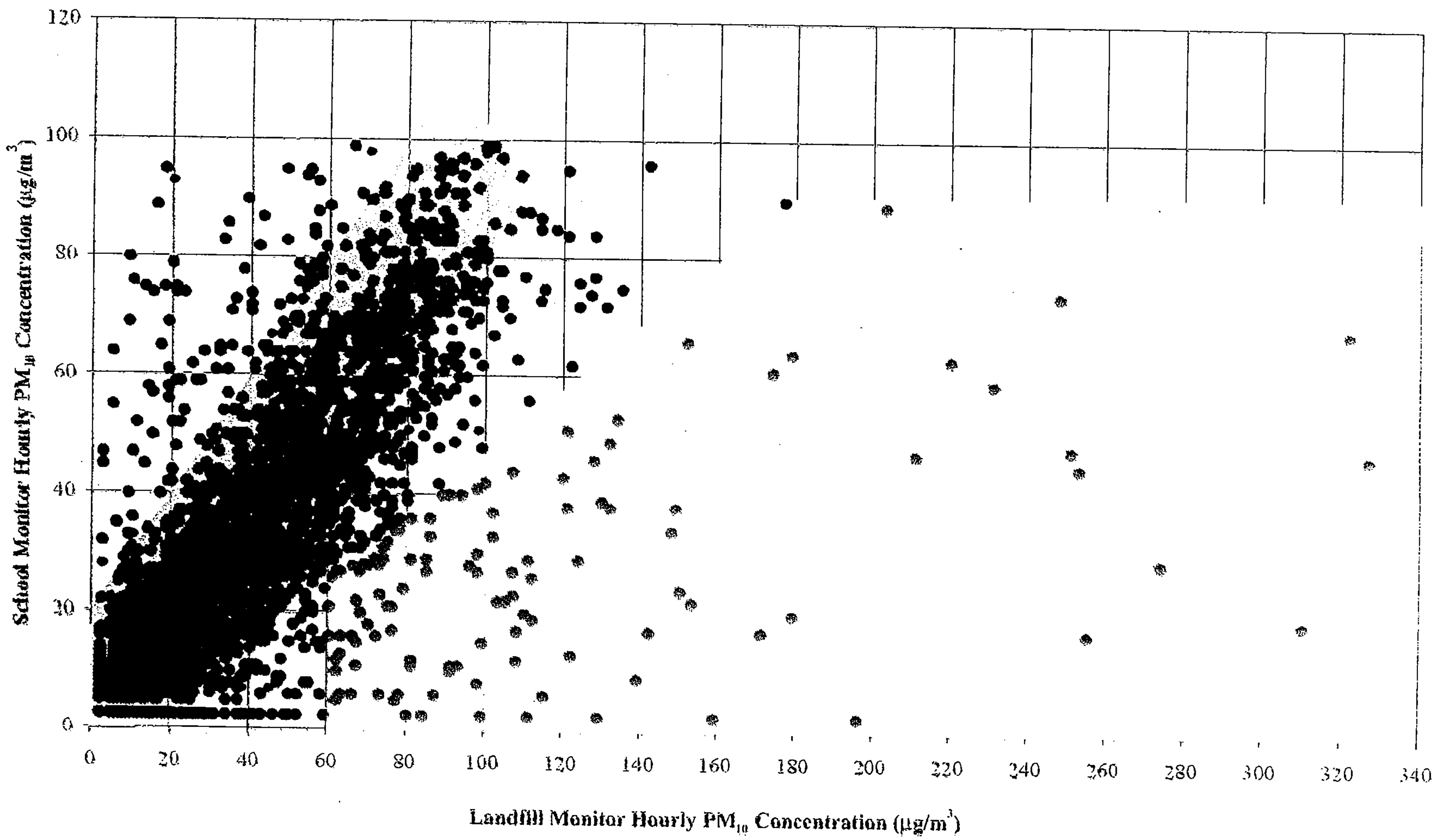

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Figure 3-12
24-Hour and Annual PM_{10} Concentrations at School and Landfill Monitors
Browning-Ferris Industries of California, Inc.
Los Angeles, California

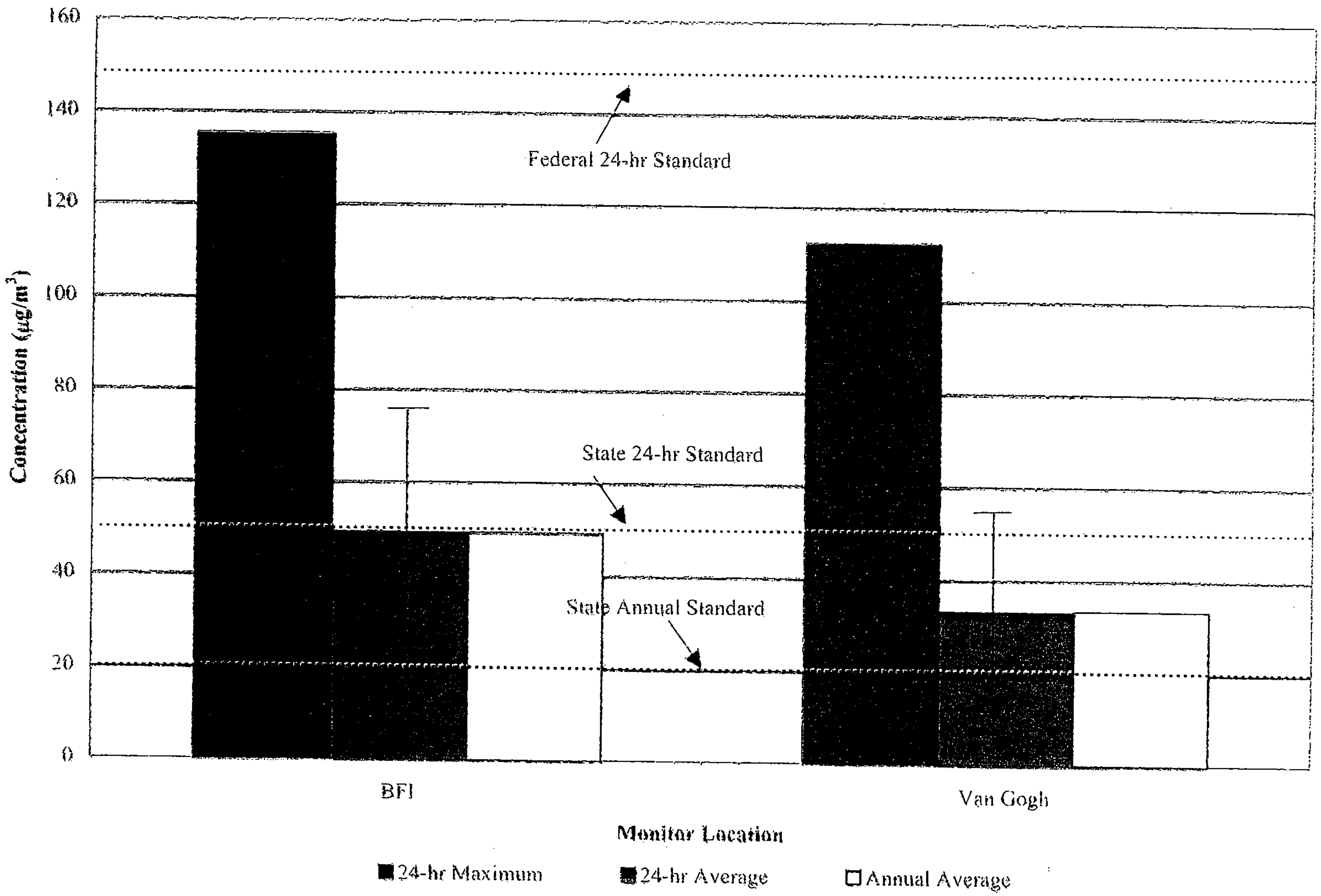

Figure 3-13
Frequency Distribution of 24-Hour Average PM_{10} Concentrations at School and Landfill Monitors
Browning-Ferris Industries of California, Inc.
Los Angeles, California

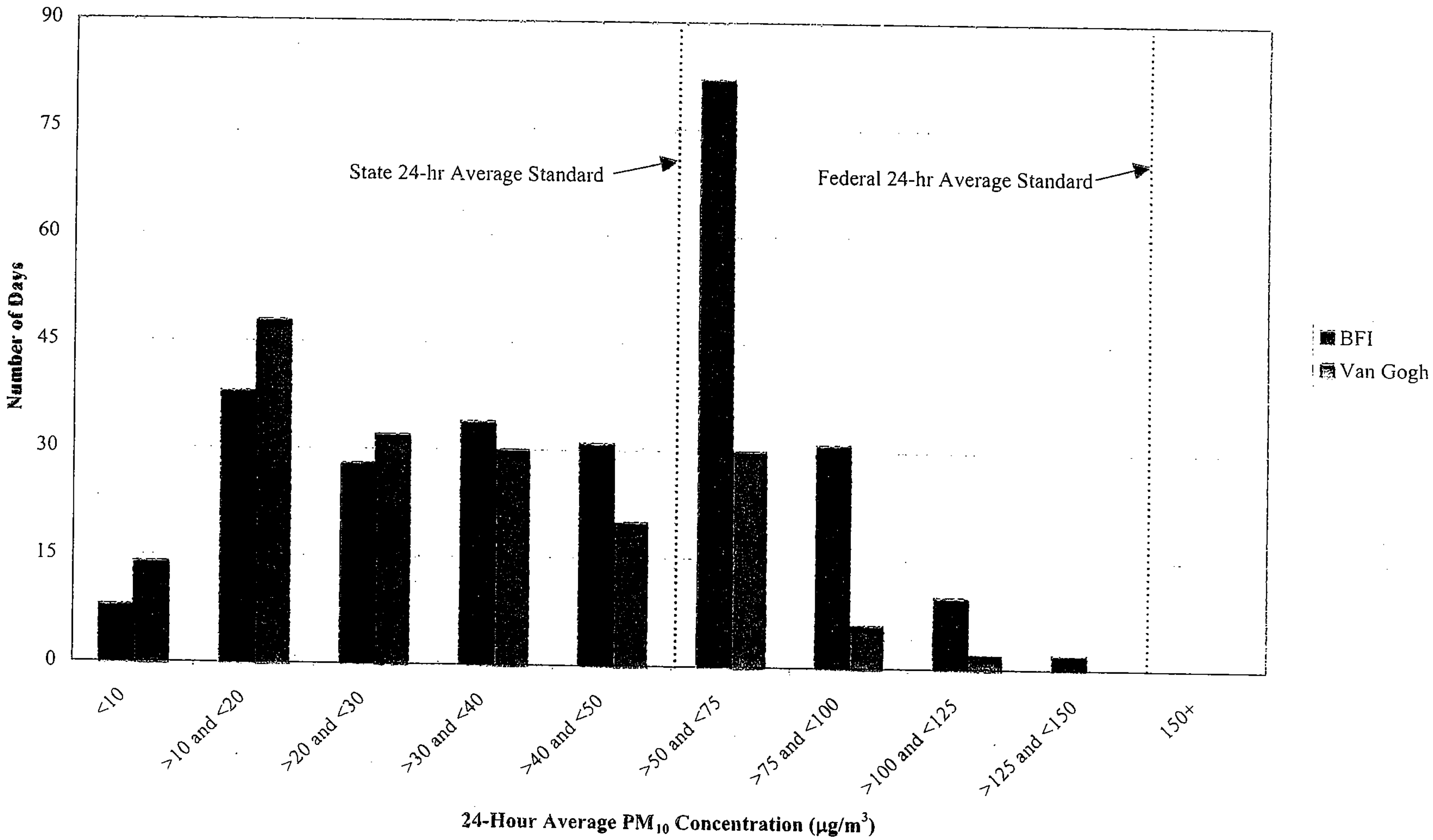

Figure 3-14
Frequency Distribution of 24-Hour Average PM_{10} Concentrations at School and Landfill Monitors
(Percentage)
Browning-Ferris Industries of California, Inc.
Los Angeles, California

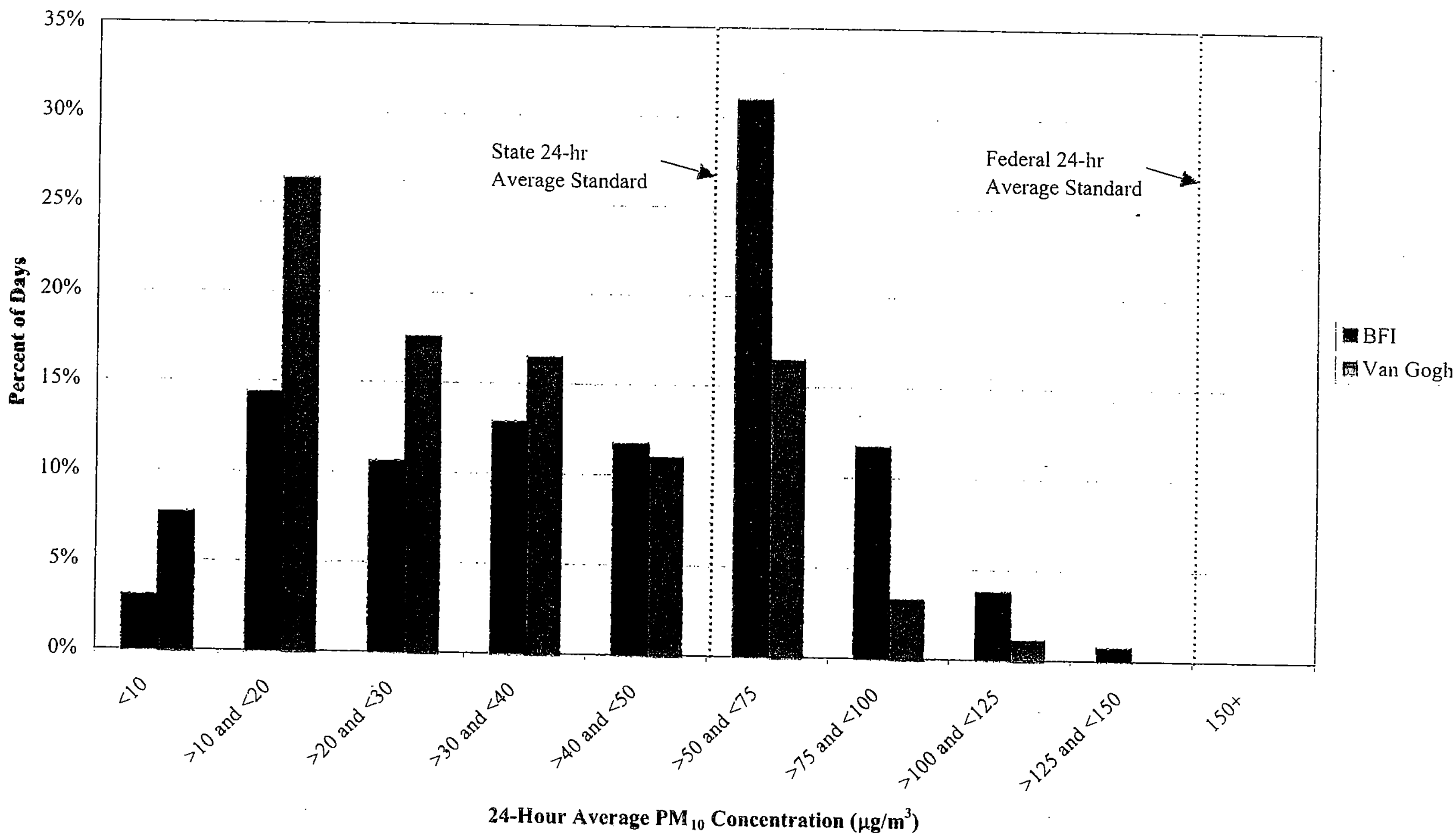

Figure 3-15
Comparison of 24-Hour PM_{10} State Standard Exceedances at the School Monitor with Other Regional Monitors
Browning-Ferris Industries of California, Inc.
Los Angeles, California

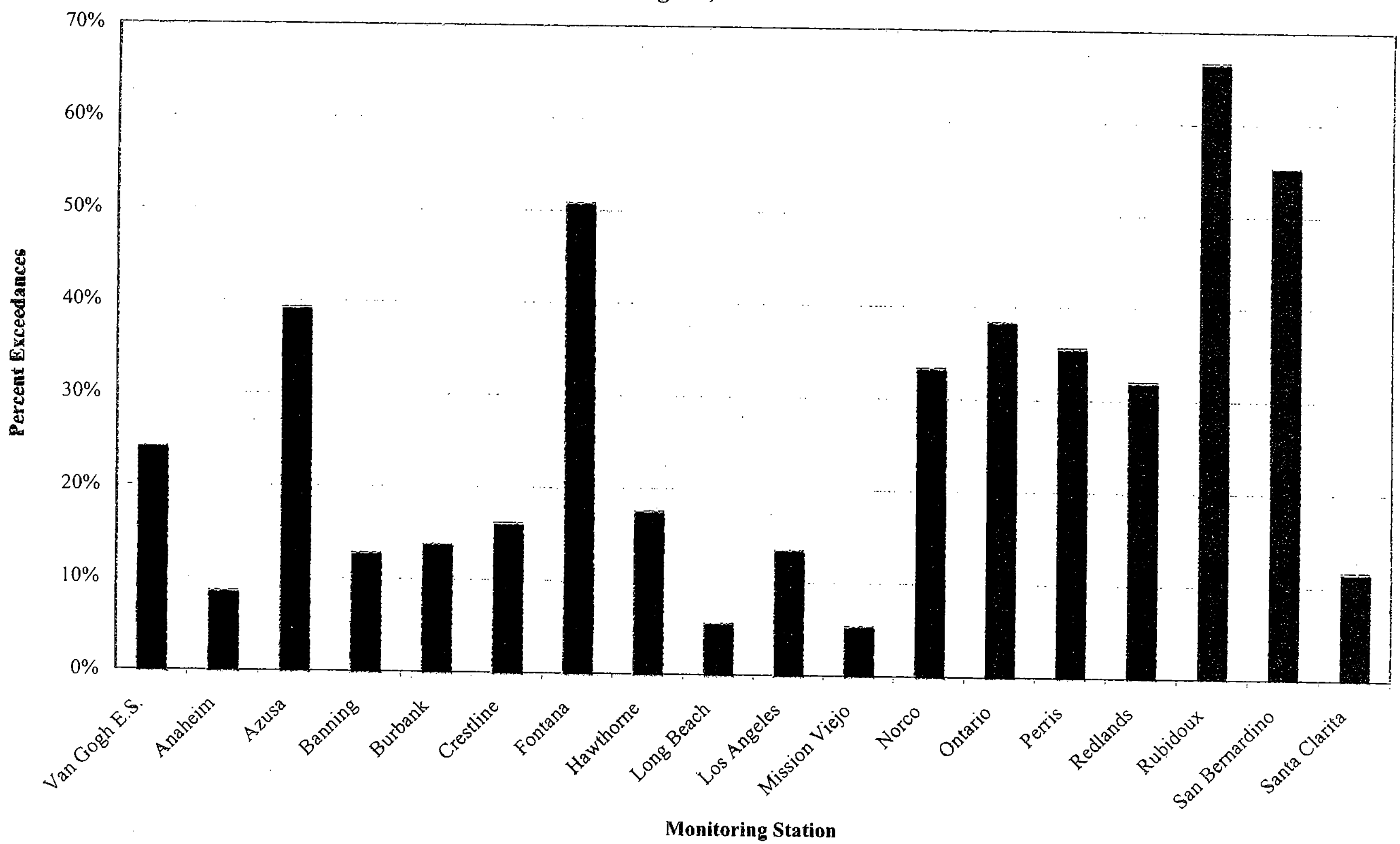

Figure 3-16
Comparison of Annual Average PM_{10} Concentrations at the School Monitor with Other Regional Monitors Browning-Ferris Industries of California, Inc. Los Angeles, California

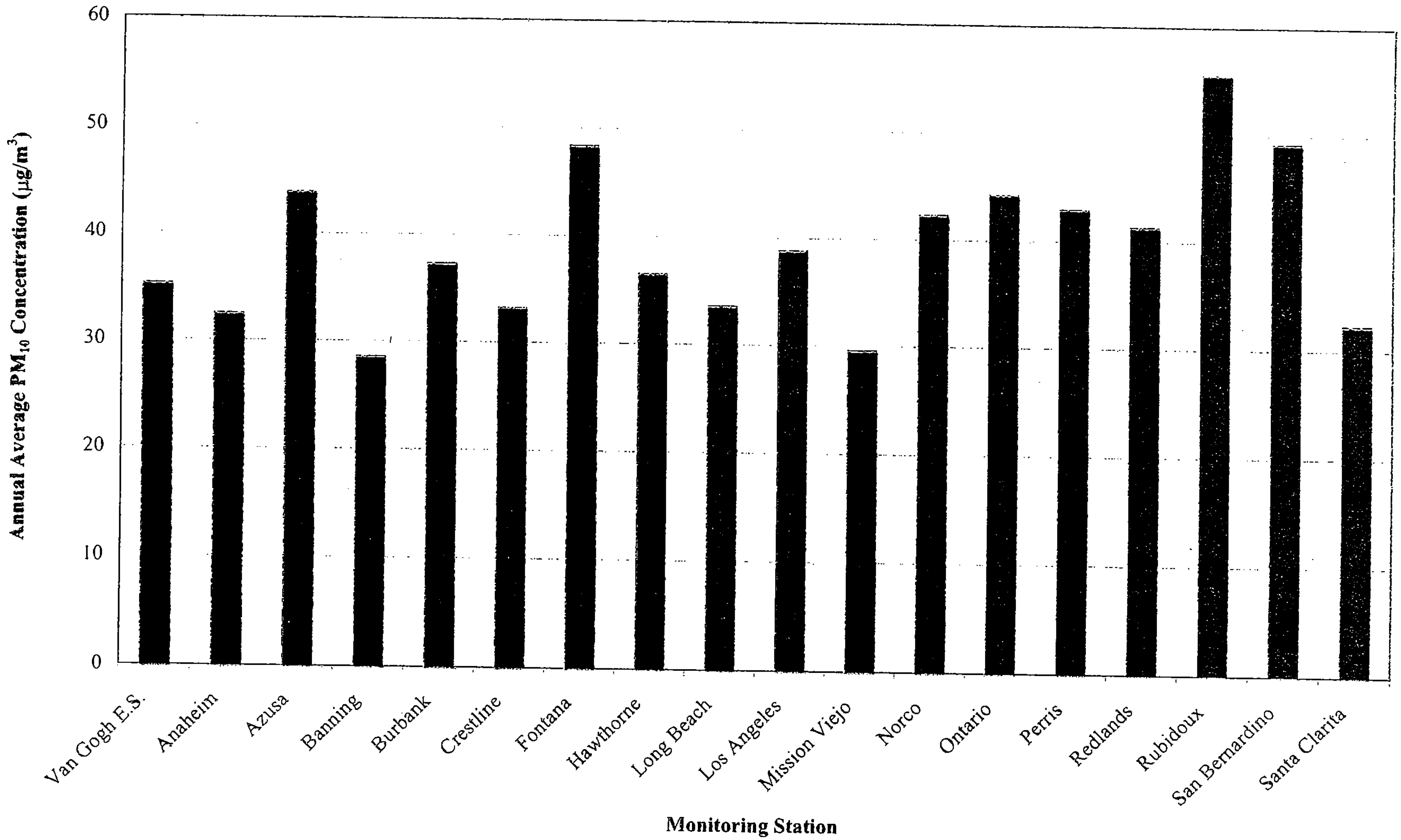

Figure 3-17
Average 1-Hour Black Carbon Concentrations by Wind Direction Sectors
All Monitoring Data
Browning-Ferris Industries of California, Inc.
Los Angeles, California

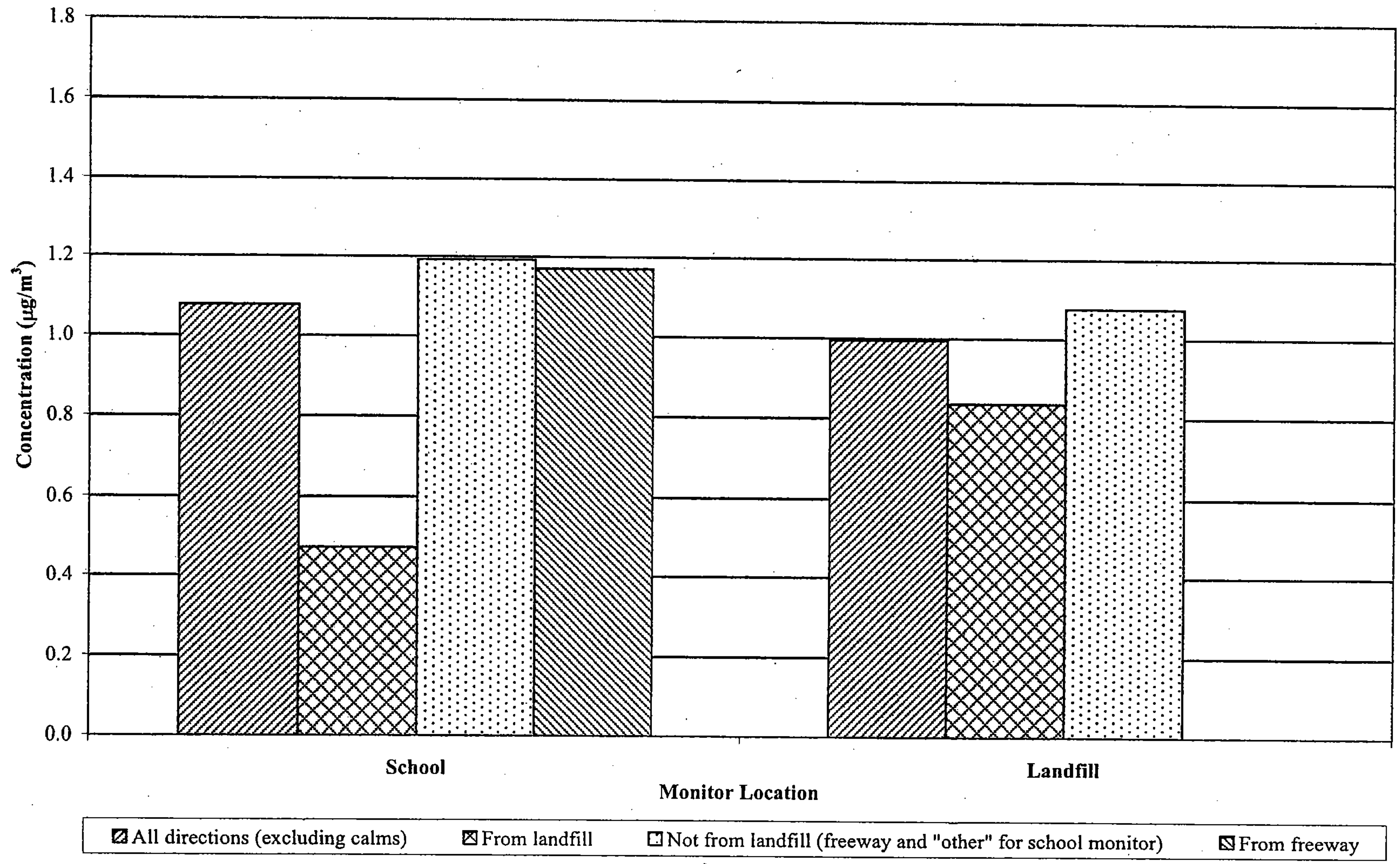

Figure 3-18
Average 1-Hour Black Carbon Concentrations by Wind Direction Sectors
Landfill Operating, Non-Rush Hours
Browning-Ferris Industries of California, Inc.
Los Angeles, California

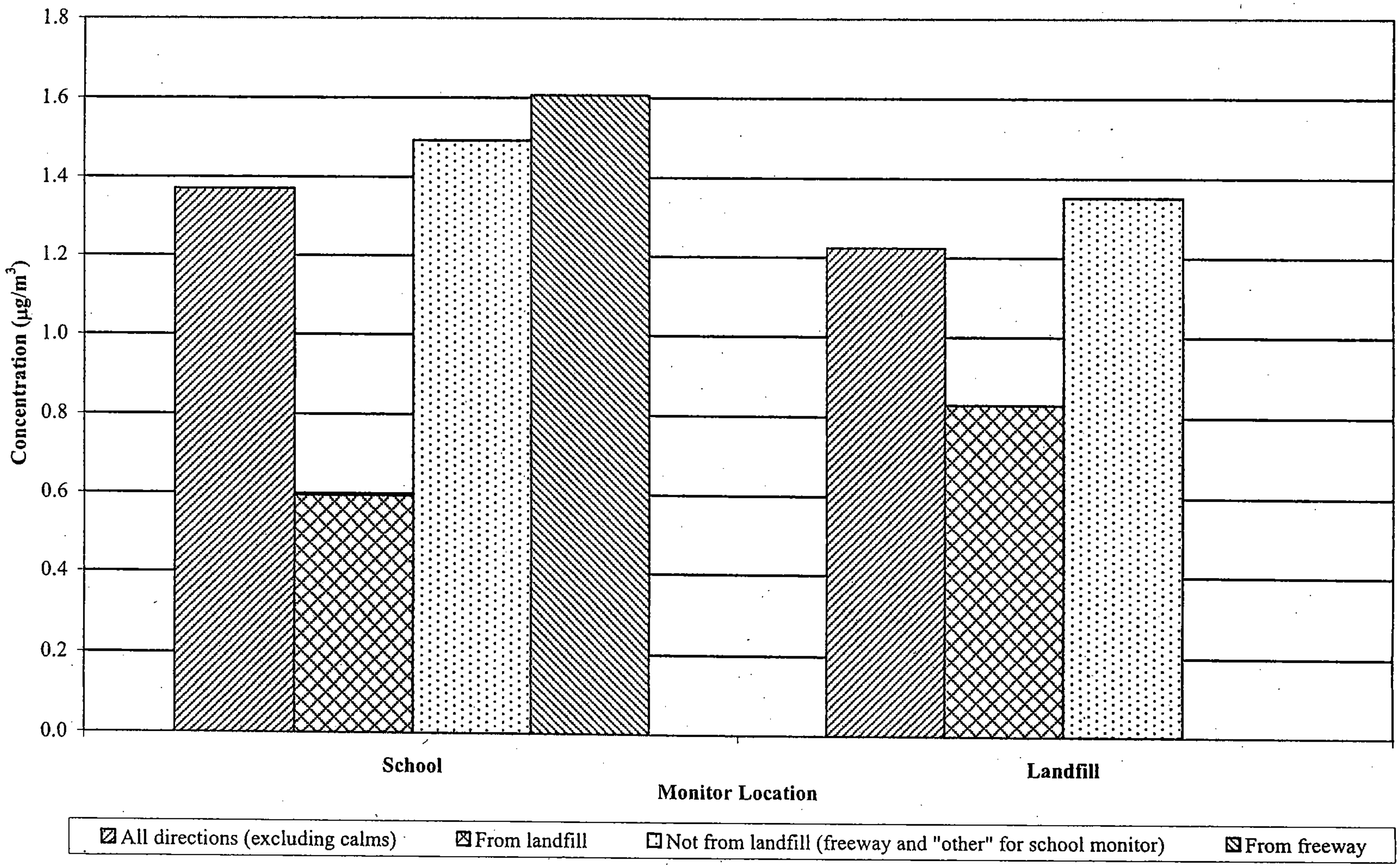

Figure 3-19
Black Carbon Concentration Rose for School Monitor for Non-Rush Landfill Operating Hours
(Monday through Friday, 10 a.m. to 2 p.m. and Saturday, 6 a.m. to 12 p.m.)
Averaged by Wind Direction
Browning-Ferris Industries of California, Inc.
Los Angeles, California

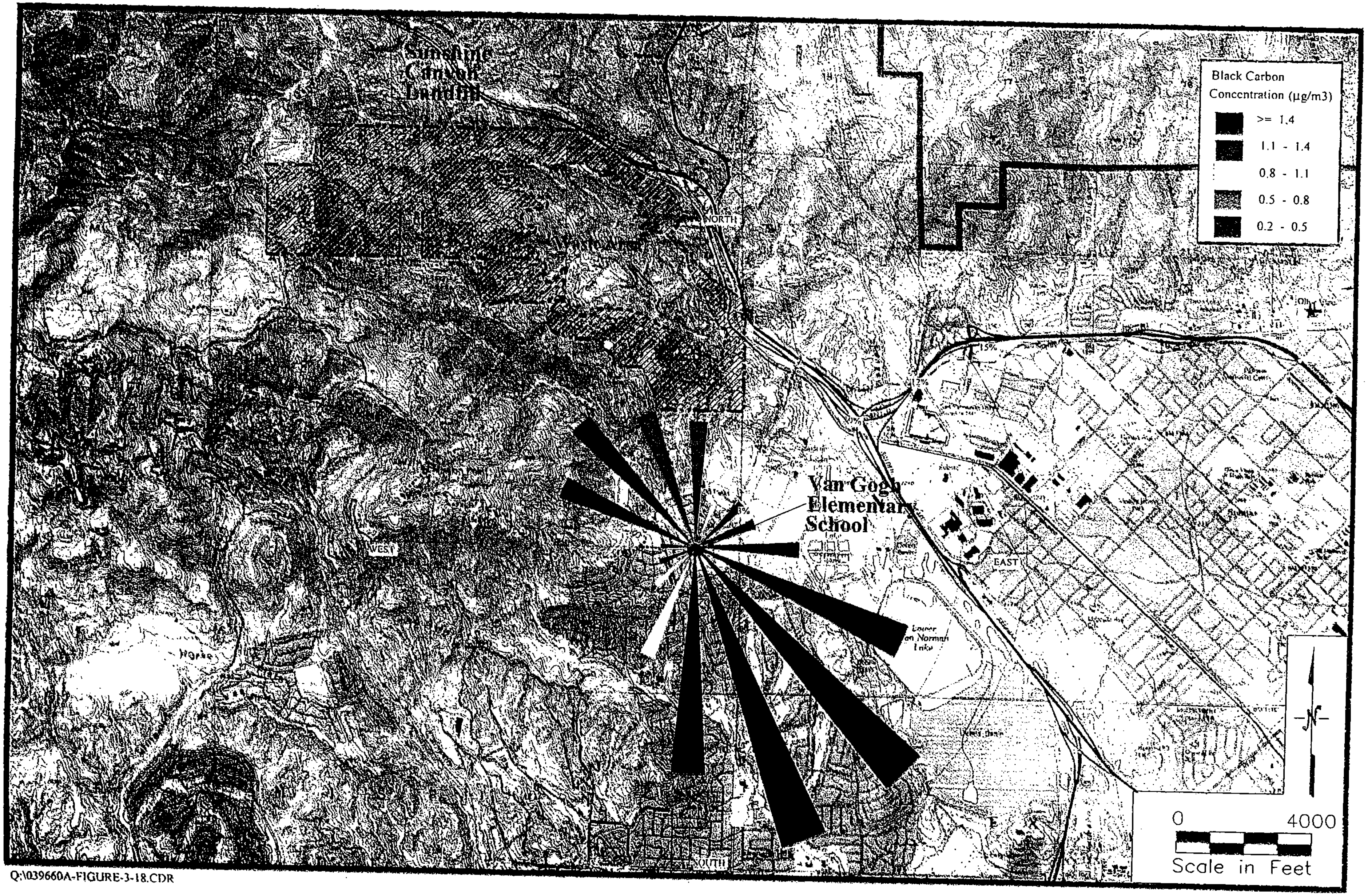

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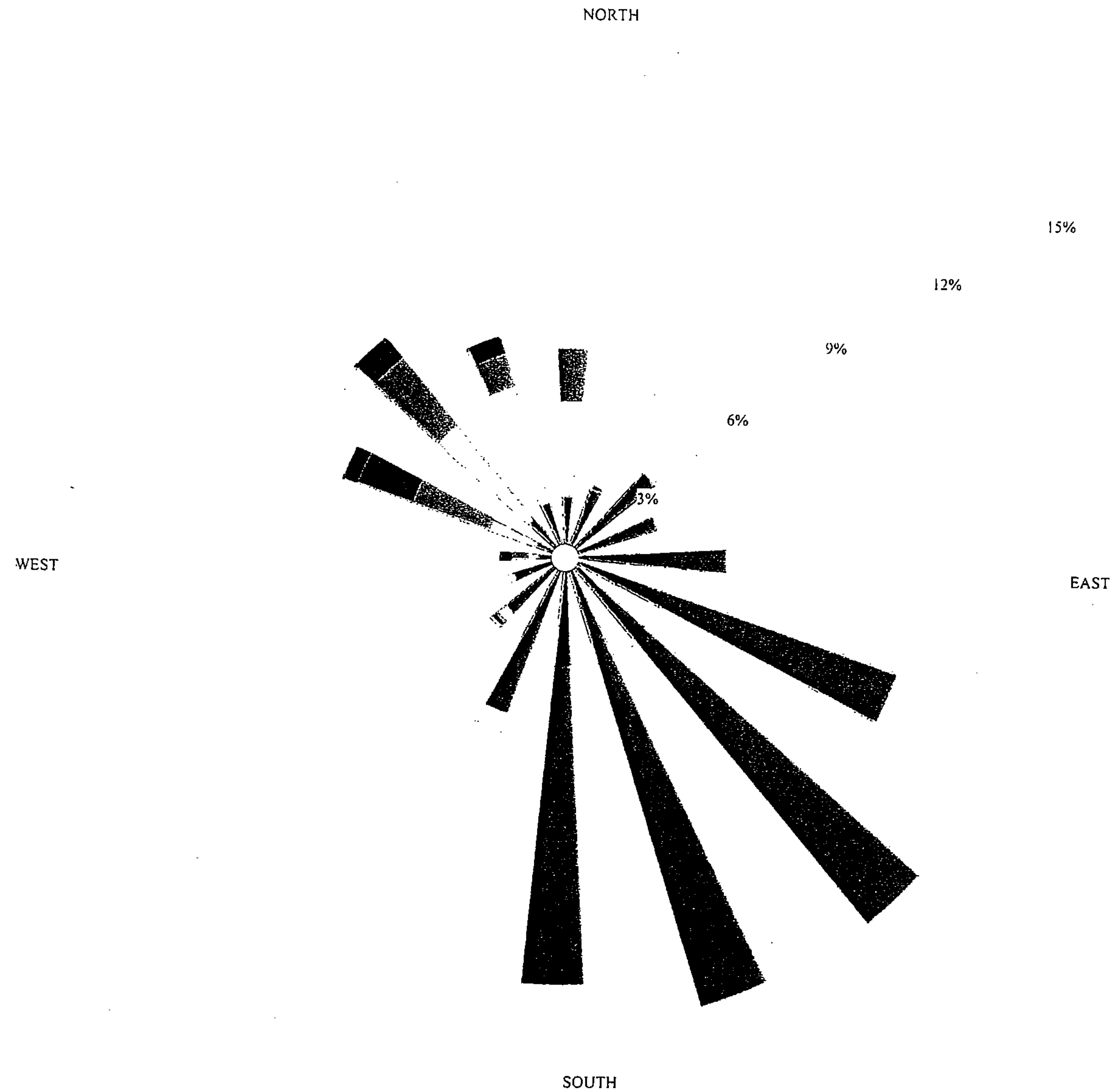
Figure 3-20 Wind Rose for School Monitor for Black Carbon Sampling during Non-Rush Landfill Operating Hours

(Monday through Friday, 10 a.m. to 2 p.m. and Saturday, 6 a.m. to 12 p.m.)



Wind Speed
(m/s)

- >= 5.0
- 4.0 - 5.0
- 3.0 - 4.0
- 2.0 - 3.0
- 1.0 - 2.0
- 0.0 - 1.0

TOTAL COUNT:

978 hours

AVG. WIND SPEED:

1.75 m/s

WRPLOT View - Lakes Environmental Software

Figure 3-21
Average 1-Hour Black Carbon Concentrations by Wind Direction Sectors
Evening Rush Hours
Browning-Ferris Industries of California, Inc.
Los Angeles, California

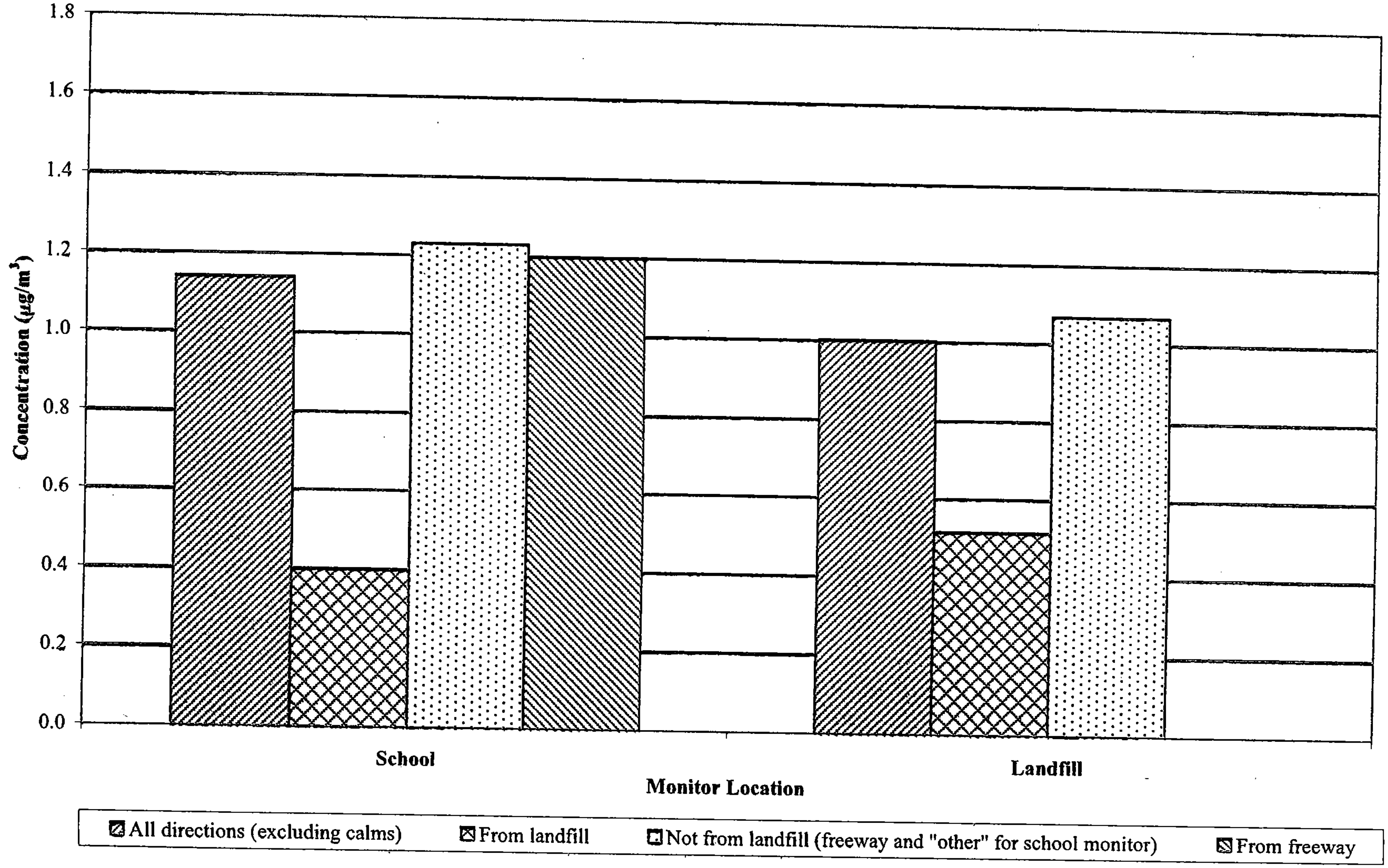


Figure 3-22
Black Carbon Concentration Rose for School Monitor for Evening Rush Hours
(Monday through Friday, 3 p.m. to 7 p.m.)
Averaged by Wind Direction
Browning-Ferris Industries of California, Inc.
Los Angeles, California

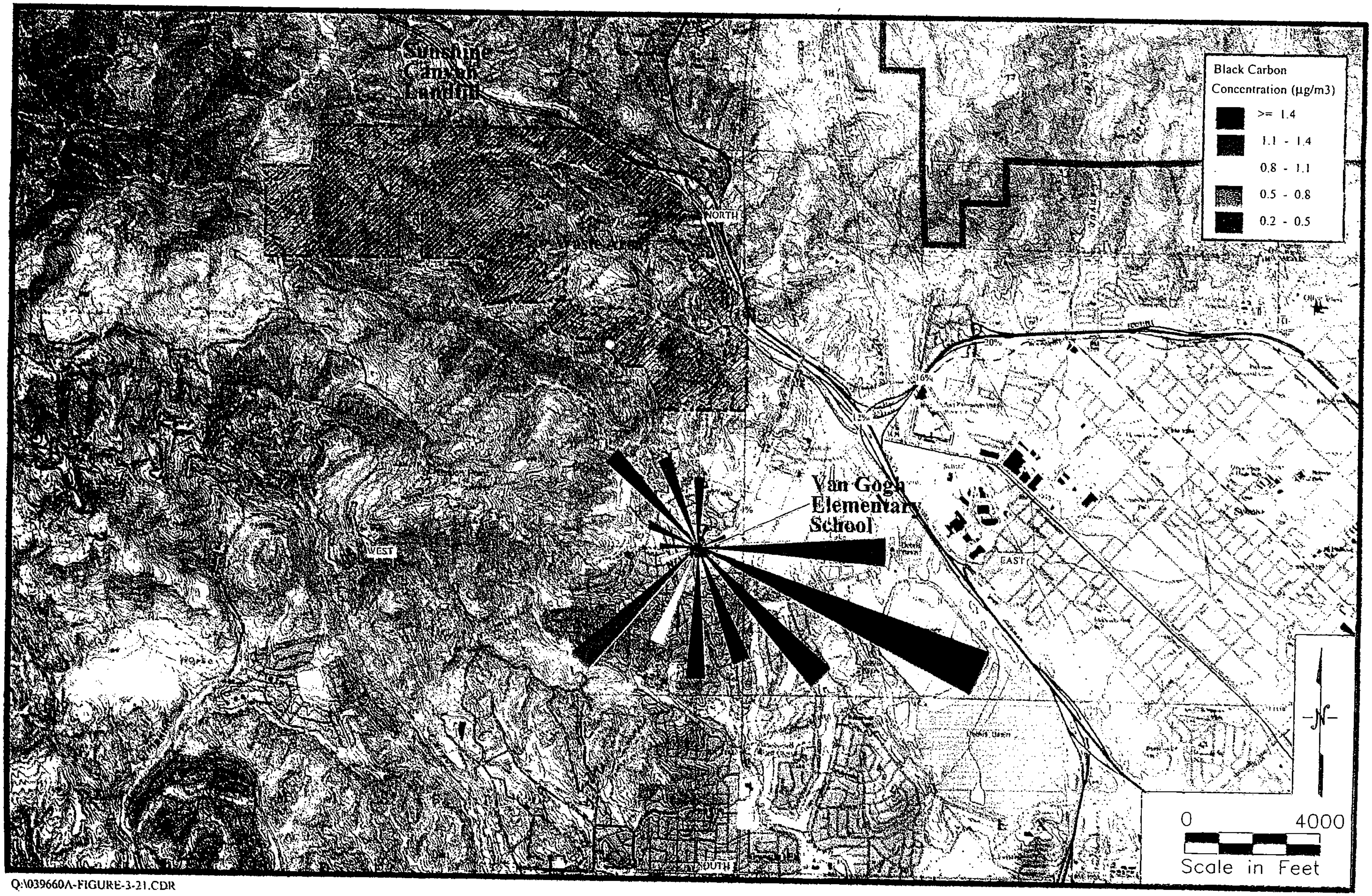


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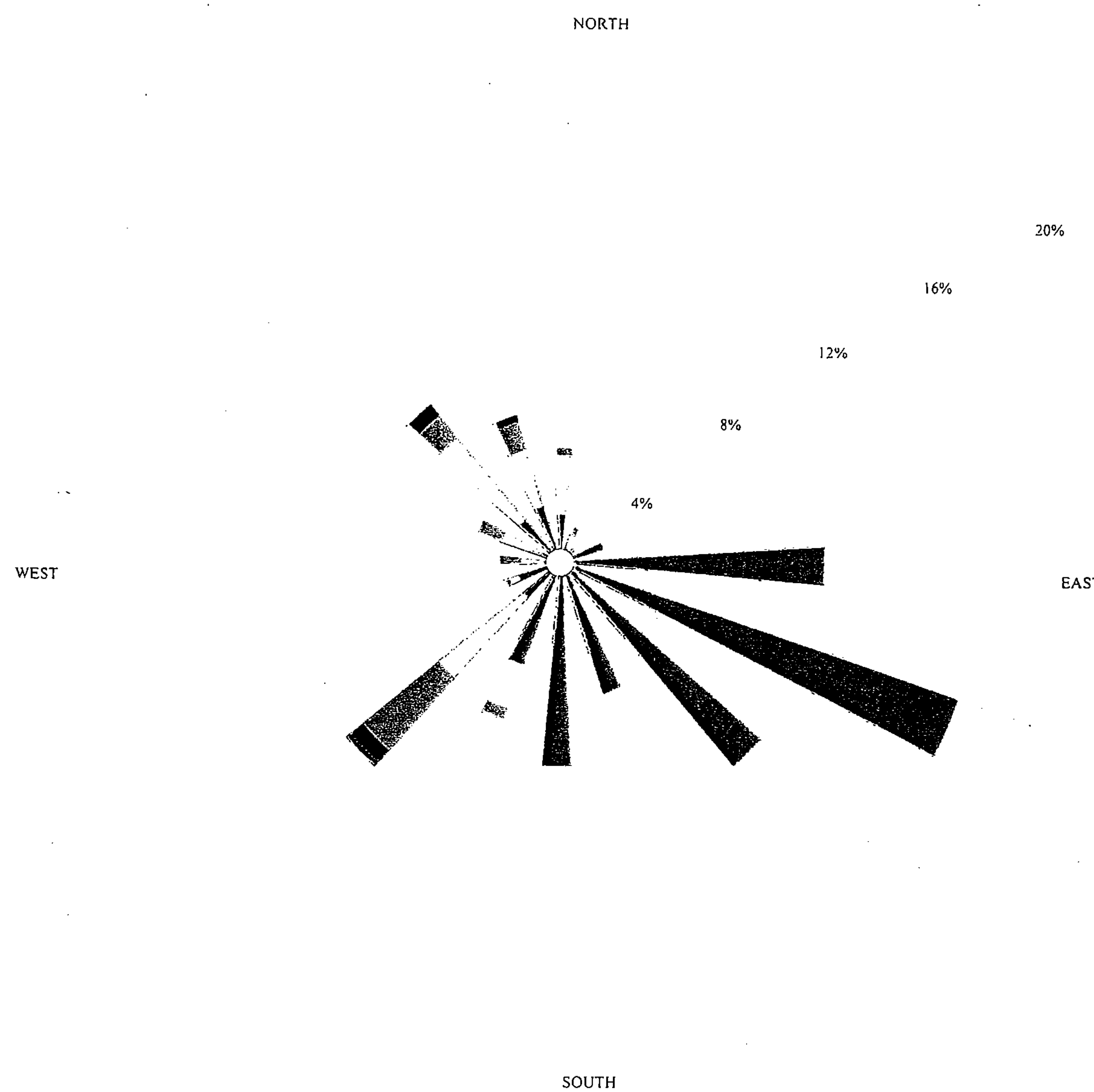
Figure 3-23 Wind Rose for School Monitor for Black Carbon Sampling during Evening Rush Hours

(Monday through Friday, 3 p.m. to 7 p.m.)



Wind Speed
(m/s)

- >= 5.0
- 4.0 - 5.0
- 3.0 - 4.0
- 2.0 - 3.0
- 1.0 - 2.0
- 0.0 - 1.0

TOTAL COUNT:

753 hours

AVG. WIND SPEED:

1.33 m/s

WRPLOT View - Lakes Environmental Software

Figure 3-24
Scatter Plot of Hourly Black Carbon at School and Landfill Monitors
Browning-Ferris Industries of California, Inc.
LosAngeles, California

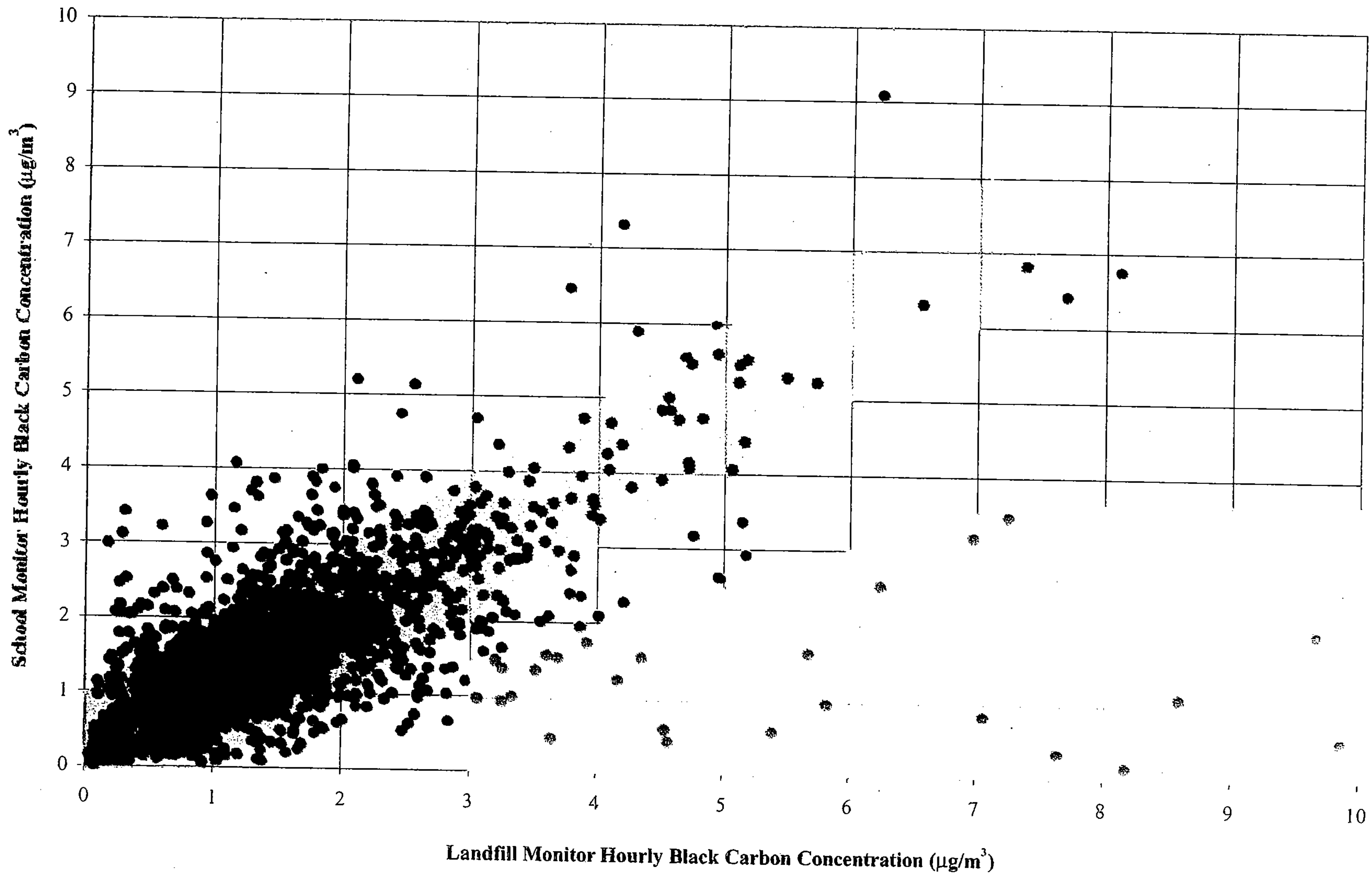


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Figure 3-25
24-Hour Average Black Carbon Concentrations at School and Landfill Monitors
Browning-Ferris Industries of California, Inc.
Los Angeles, California

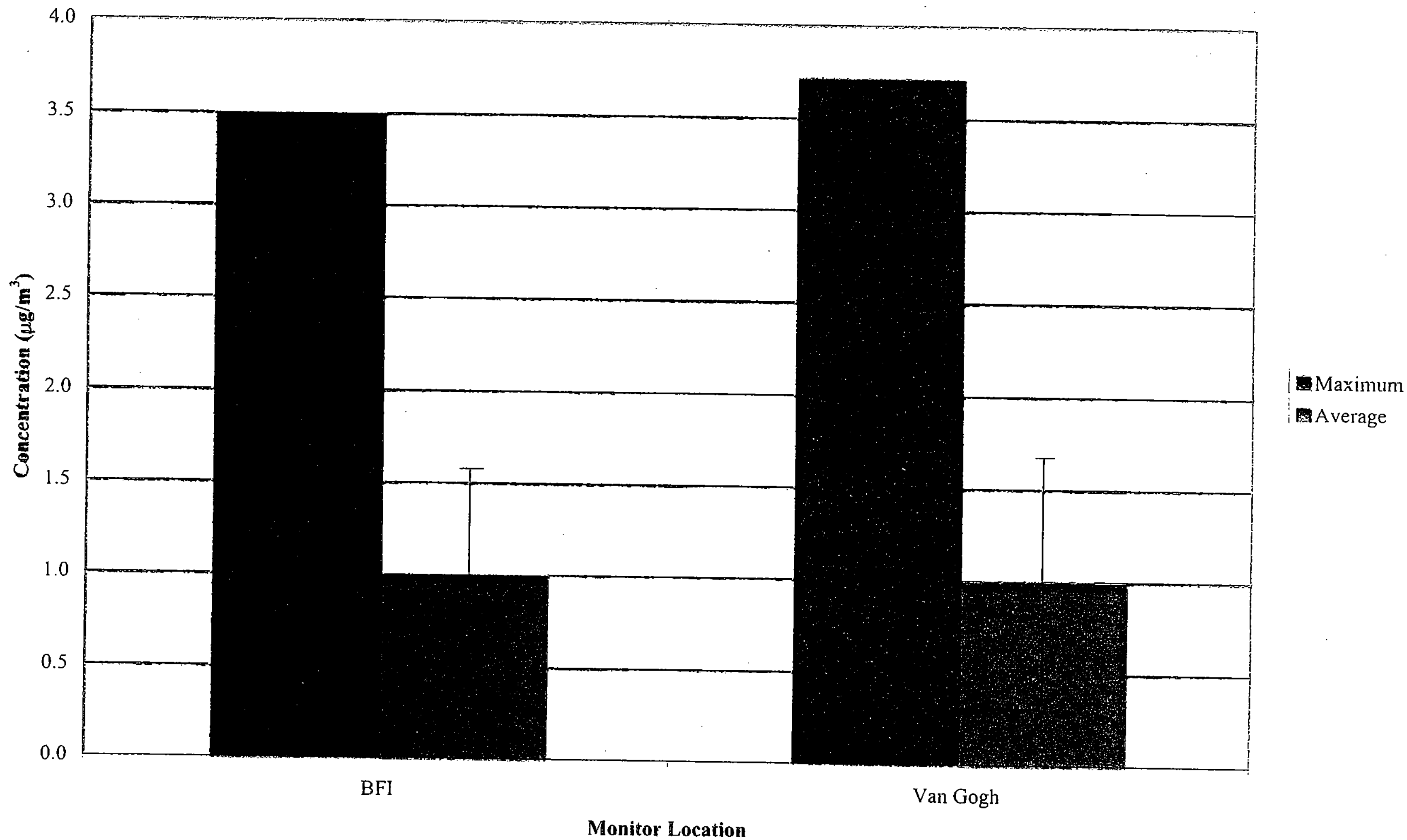


Figure 3-26
Comparison of 24-Hour Average Black Carbon Concentrations at the School Monitor with Other Regional Monitors (MATES-II)
Browning-Ferris Industries of California, Inc.
Los Angeles, California

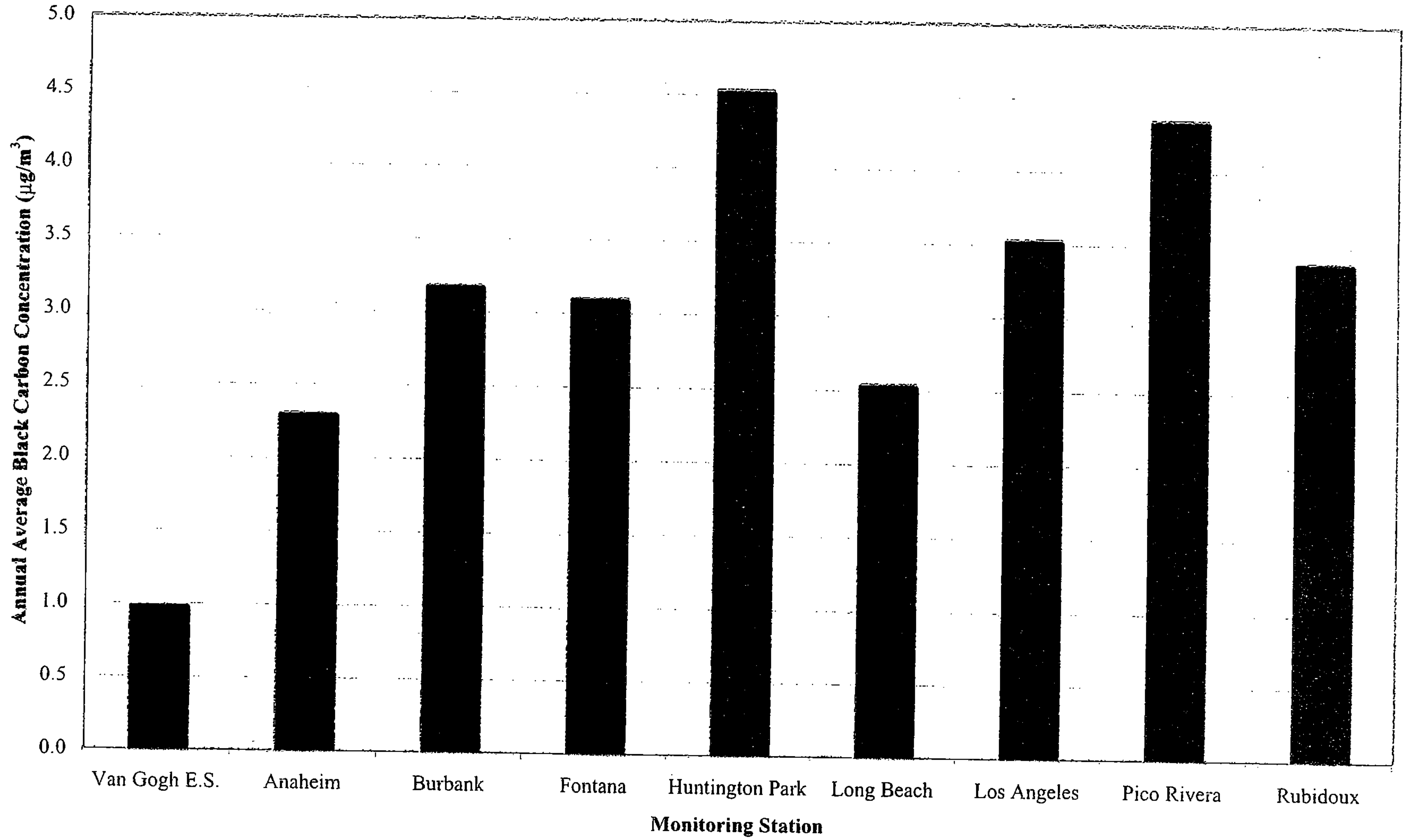
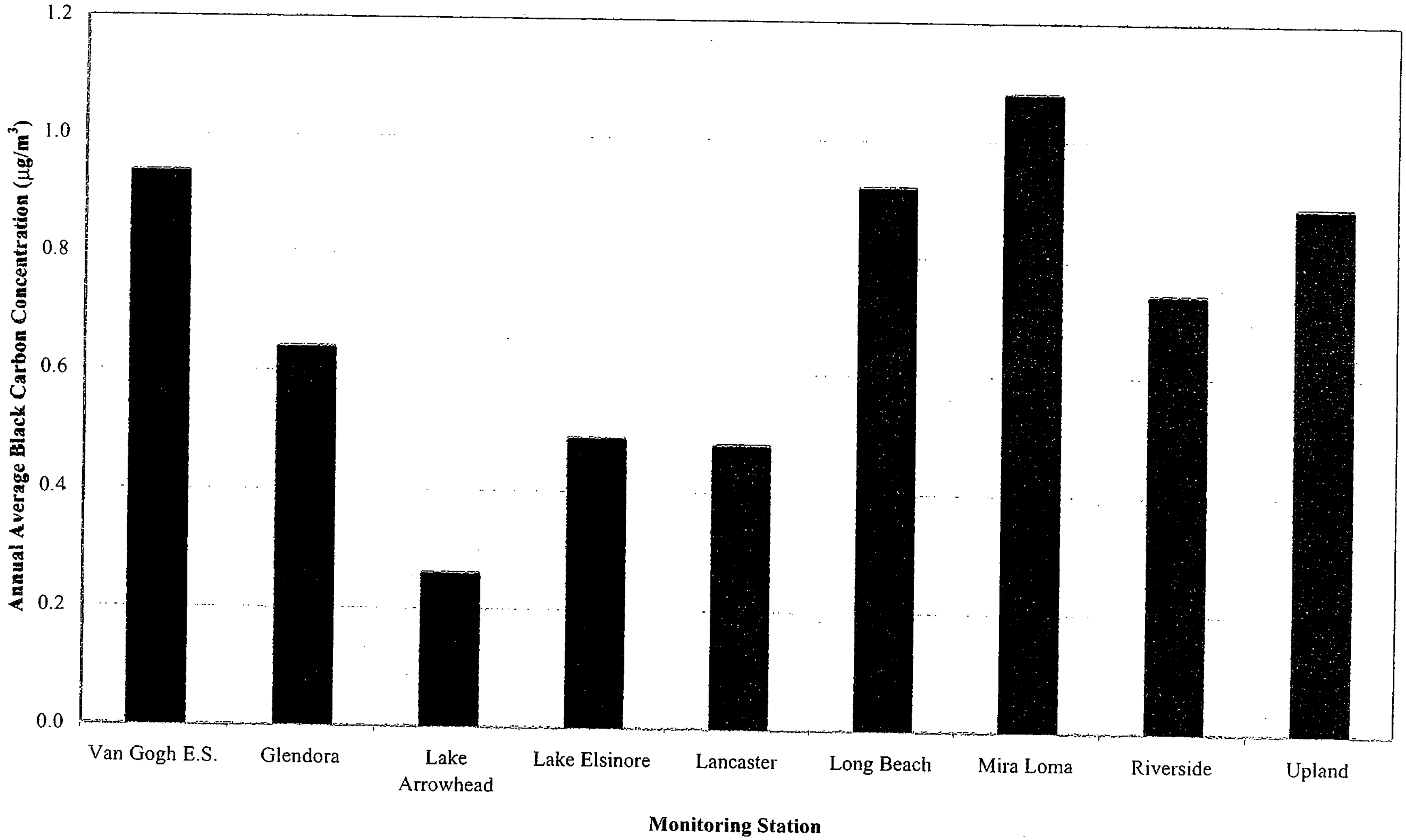


Figure 3-27
Comparison of Two-Week Average Black Carbon Concentrations at the School Monitor with Other Regional Monitors (CHS)
Browning-Ferris Industries of California, Inc.
Los Angeles, California



APPENDIX A

MONITORING PROGRAM DESCRIPTION

sampled air passes through a quartz fiber filter that is monitored for attenuation of beta particles from a carbon-14 source resulting from the collected mass of particulates. The filter tape is advanced automatically throughout the cycle. During each hourly cycle, the instrument does a self-calibration check and background/blank check from the filter material. The output is recorded by an on-board data logger, which also serves to collect the hourly input from the wind speed and wind direction sensors, thereby providing a correlation between these two parameters. Data was downloaded periodically for inclusion in a database of monitoring data.

A.3 Black Carbon Sampling

Diesel particulate matter (DPM) is a complex mixture of organic species. Although many of the individual species can be sampled and analyzed, there is no one universal method for measuring composite DPM in ambient air. There are, however, two main approaches that have been used to monitor DPM in ambient air: (1) integrated sampling using quartz fiber filters followed by a combustion analysis method and (2) continuous monitoring using a surrogate for the DPM material. The various integrated methods are extensions of National Institute of Occupational Safety and Health (NIOSH) Method 5040, which is an occupational safety method and is not applicable directly to monitoring of ambient air as a result of higher detection limits and shorter sampling periods. The continuous method uses the Andersen/Magee Scientific Model AE-16 aethalometer.

A continuous method for monitoring DPM provides an opportunity to correlate DPM with hourly PM_{10} concentrations. In addition, a continuous method allows for the directional analysis of the time-resolved measurements, thus eliminating the need for a more extensive network of monitoring locations to provide upwind and other sector-based information. Furthermore, the continuous monitoring aethalometer is automatic and operates for weeks without maintenance. The aethalometer instrument was determined, therefore, to provide more information for the objectives of this program than the integrated sampling method.

Black carbon, a commonly recognized surrogate for DPM, was collected using an Andersen Instruments Model AE-16 aethalometer. The aethalometer uses the absorption of 880 nanometer (nm) wavelength light to detect black carbon collected on a quartz fiber filter. The light absorption at 880 nm is dominated by black carbon from combustion sources, including diesel exhaust. Air is sampled through a sample 3/8-inch inner diameter conductive tubing inlet through a filter tape. This tape is advanced automatically during the 15 minute monitoring cycle, depending on filter loading.

The average of the ratio of elemental carbon to black carbon for this dataset was 0.91. The data is fairly scattered about the mean. The standard deviation is 0.27 or 29% of the mean. The 90% confidence interval is 0.84 to 0.98. Hence, it appears likely that that the black carbon measurements are a good representation of the level of diesel particulates in the air at the site. No site-specific correction factor was applied to the black carbon data presented in this report.

A.4 Meteorological Monitoring

Wind speed, wind direction, and a measure of variability in wind direction (sigma theta value)[2] were monitored on an hourly basis at both monitoring sites using Prevention of Significant Deterioration (PSD) program-approved sensors supplied by MetOne Instruments. The siting guidelines for the PSD program and the World Meteorological Organization (WMO) were followed as much as was practical. Since the monitoring program is temporary, a standard 10-meter tower was determined to be impractical at the landfill monitor, especially considering that a 10-meter tower already exists nearby. Therefore, the sensors were placed on a tripod on top of the monitoring equipment trailer at a height of approximately six meters. This height complies with the WMO criteria but not with the PSD requirements.

For the school monitor, the monitoring site at the side of a classroom trailer required a greater height than five to six meters in order to eliminate the building effects. Therefore, a 10-meter tower was installed to provide for more rigorous data collection at that site.

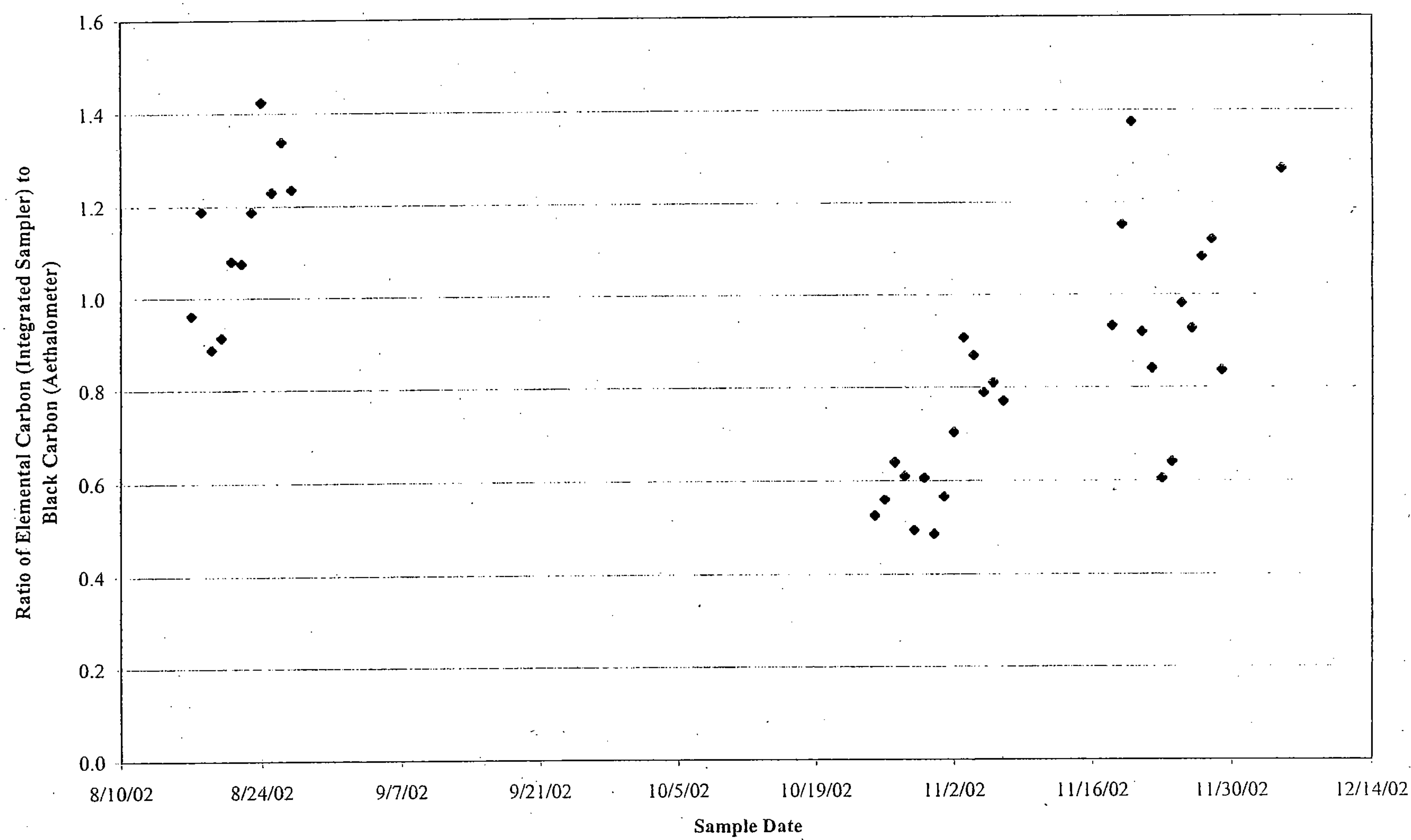
For both sites, the data are averaged over one-hour periods and the values are stored in the BAM data logger, along with the BAM PM_{10} data.

A.5 Quality Assurance

All inlet flows were calibrated according to 40 CFR Part 50 requirements for continuous monitors in terms of frequency and acceptance. In addition, guidance found in USEPA manuals (USEPA 1998) has been followed. The frequency of flow rate calibration checks is specified to be quarterly for the continuous reference methods, but has been conducted on a bimonthly basis when the BAM filter tape is changed. Blanks for the integrated samples will be collected at a 10 percent frequency. Since integrated sampling for the sigma correlation will be short-term, no duplicate sampling will be conducted. Besides the periodic flow rate checks, standard equipment

[2] Sigma theta, the standard deviation in the varying wind direction, is a measure of the stability of the atmosphere. The stability of the atmosphere is classified as either stable, neutral, or unstable, and indicates the degree of vertical mixing in the atmosphere.

Figure A-1
Black Carbon Calibration Data (Chronological)
Browning-Ferris Industries of California, Inc.
Los Angeles, California



u:\sunshine\air monitoring baseline\report\final report\bfi report graphs rev1.xls-Figure A-1

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APPENDIX B

AIR MONITORING DATABASE CONSTRUCTION AND DESIGN

184 hours to 892 hours. Data gaps of less than 24 hours typically result from the exclusion of data due to failure of the validation rules described in Section B.1; these shorter data gaps account for 3.2% of the monitoring data.

B.1.2. Black Carbon Data

Between November 22, 2001 and November 21, 2002, a total 4,602 hours of validated black carbon monitoring data was collected at both the landfill monitor and the school monitor. This represents 53% of the total number of hours during this time period. The landfill monitor captured data 74% of the time and the school monitor captured data 71% of the time. At the landfill monitor, there were nine periods of missing data that exceeded 24 hours, ranging from 62 hours to 422 hours. Data gaps of less than 24 hours typically result from the exclusion of data due to failure of the validation rules summarized in Section B.1; these shorter data gaps account for 1.1% of the monitoring data. At the school monitor, there were four periods of missing data that exceeded 24 hours, ranging from 88 hours to 689 hours. Data gaps of less than 24 hours typically result from the exclusion of data due to failure of the validation rules summarized in Section B.1; these shorter data gaps account for 0.5% of the monitoring data.

B.2 Data Excluded from Analysis

Three days of landfill monitoring data were excluded as a result of issues with the monitoring equipment or landfill conditions. These three days are described in this section. First, data from December 7, 2001 were excluded due to on-site construction activity immediately adjacent to the landfill monitor. The monitor on that day recorded dust from equipment that was within 10 meters of the monitor. Second, on February 9, 2002, high winds caused the trailer at the landfill monitoring site to upend. The conditions in the trailer immediately prior to the equipment failure are unknown, but it is likely that the trailer was rocking and shaking prior to the equipment outage. The equipment is not built to run properly under these conditions, and the data is suspected to be invalid. As a result, the entire day was excluded from the data analysis. Furthermore, no data or invalid data was recorded from February 10, 2002 to February 26, 2002 because of sensor malfunction, likely due to the trailer upending. Third, data from March 13, 2002 was excluded due to a power outage for a portion of the day at the landfill monitoring site. Similar to February 9, the conditions leading up to a power outage have the potential to produce erroneous readings. As a result, data from the entire day was also excluded from the analysis.

Table B-1
Data Validation Rules
Browning-Ferris Industries of California, Inc.
Los Angeles, California

Data Type	Data Value	Error Description	Data Treatment
PM_{10} concentration	< 0 $\mu g/m^3$	Out of range value	Excluded from analysis
	< 5 $\mu g/m^3$	Non-detect	Included in analysis as half the detection limit
	>= 995 $\mu g/m^3$	Out of range value	Excluded from analysis
Black carbon concentration	< 0 ng/m^3	Out of range value	Excluded from analysis
	< 50 ng/m^3	Non-detect	Included in analysis as half the detection limit
	>= 10 $\mu g/m^3$	Out of range value	Excluded from analysis
Wind speed	<= 0.2 m/s	Null signal value	Excluded from analysis
	<= 0.4 m/s	Out of range value	Included as calm in analysis
	> 50 m/s	Unreasonably high value	Excluded from analysis
Wind direction	> 360 or <1	Out of range value	Excluded from analysis

APPENDIX C

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT'S PM_{10} MONITORING DATA ANALYSIS

APPENDIX C

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT'S PM_{10} AIR MONITORING DATA ANALYSIS

This appendix contains a description of the monitoring sites maintained by the SCAQMD that were analyzed for comparison with the measured data. This section also contains details on the methods used to compare the monitored ambient air concentrations.

C.1 SCAQMD Air Quality Monitoring Network

The South Coast Air Quality Management District (SCAQMD) maintains an air quality monitoring network. The SCAQMD encompasses Los Angeles County, Orange County, Riverside County, and the non-desert portion of San Bernardino County. Monitors placed throughout the District, measure various criteria pollutants including PM_{10}. The monitors are located in residential, commercial, urban, and rural areas. The highest 24-hour average PM_{10} concentration measured in the District in 2002 was 130 $\mu g/m^3$ at the Rubidoux monitor. The monitor with the greatest number of exceedances of the California 24-hour average PM_{10} standard was the Rubidoux monitor with 81 exceedances in 2002. None of the monitors in the District measured an exceedance of the federal 24-hour average PM_{10} standard in 2002. USEPA has a list of all monitors in California, including those within the SCAQMD[1]. Table C-1 presents a listing from this website of all PM_{10} monitors in the District. Figures C-1 and C-2 depict the locations of the District's monitors. PM_{10} monitors collect data every sixth day.

C.2 Review of Data from Comparable Monitors

The USEPA categorizes each monitor with respect to land use and location type. All 18 monitors in the SCAQMD were selected for comparison to the monitoring conducted at the school. These monitors are: Azusa (#70060), Burbank (#70069), Hawthorne (#70094), Los Angeles (#70087), North Long Beach (#70072), and Santa Clarita (#70090) monitors in Los Angeles County, the Anaheim (#30176), El Toro (#30186), and Mission Viejo monitors in Orange County, the Banning (#33164), Norco, Perris (#33149), and Rubidoux (#33144) monitors in Riverside County, and the Crestline (#36181), Fontana (#36197), Ontario (#36025), Redlands (#36204), and San Bernardino (#36203) monitors in San Bernardino County. Figure C-3 depicts the locations of these monitors relative to the school monitor.

[1] http://www.epa.gov/air/data/monloc.html

Data is available from the California Air Resources Board (CARB) for these monitors several months after collection. It should be noted that data for the monitoring period was not available from CARB for the El Toro monitor. Our comparison of data collected at the remaining 17 monitors considers the data collected from November 22, 2001 through November 21, 2002. This data was obtained from the CARB website[2].

The SCAQMD's monitoring network collects data every sixth day. Periodically, for various reasons including monitoring equipment issues, a data collection day is either missed or postponed. In our comparison, we looked at only those days on the regular sixth day schedule and compared data from the school's monitor only if data was available from at least one other monitor on the regular sixth day schedule. Table C-2 presents the number of data points available for each monitor on the regular sixth day schedule, as well as the number of data points available at the school monitor for days coincident with the District's regular sixth day monitoring schedule. This table also summarizes the number of days that each monitor, including the school, measured a 24-hour average PM_{10} concentration greater than the California 24-hour average PM_{10} standard. Annual average PM_{10} concentrations were calculated as mean of 24-hour average concentrations for days that coincide with the SCAQMD monitors' sixth day sampling schedule. These concentrations are presented in Table C-2. It should be noted that the annual average PM_{10} concentration at all of the monitors exceeded the California annual average PM_{10} standard.

The fraction of monitoring days that exceeded the California 24-hour standard ranged from 5% to 67% for the 17 regional SCAQMD monitors. The average exceedance rate at the 17 SCAQMD monitors was 27%. The school monitor recorded exceedances of the California 24-hour standard 24% of the time. The annual average PM_{10} concentrations for the 17 regional SCAQMD monitors ranged from 28.5 $\mu g/m^3$ to 55.6 $\mu g/m^3$. The average annual average PM_{10} concentration at the 17 SCAQMD monitors was 39.4 $\mu g/m^3$. The annual average PM_{10} concentration at the school monitor was 35.2 $\mu g/m^3$. Thus, the PM_{10} concentrations measured at the school monitor are at the lower end of concentrations measured at monitors throughout SCAQMD.

[2] http://www.arb.ca.gov/adam/cgi-bin/db2www/adamweekly.d2w/start

Table C-1

South Coast Air Quality Management District PM_{10} Monitors

Browning-Ferris Industries of California, Inc.

Los Angeles, California

Monitor ID	Beginning Year	Address	City Name	County	Land Use	Location Type
06-037-0002-81102-2	1985	803 N. Loren Avenue	Azusa	Los Angeles	Residential	Suburban
06-037-1002-81102-2	1985	228 W. Palm Avenue	Burbank	Los Angeles	Commercial	Urban/Center City
06-037-1103-81102-2	1985	1630 N. Main Street	Los Angeles	Los Angeles	Residential	Urban/Center City
06-037-4002-81102-2	1985	3648 N. Long Beach Boulevard	Long Beach	Los Angeles	Residential	Suburban
06-037-5001-81102-1	1989	5234 W. 120th Street	Hawthorne	Los Angeles	Commercial	Urban/Center City
06-037-6002-81102-1	1989	San Fernando Road	Santa Clarita	Los Angeles	Commercial	Suburban
06-037-6012-81102-1	2001	22224 Placerita Canyon Road	Santa Clarita	Los Angeles	Commercial	Suburban
06-059-0001-81102-1	1990	1610 S. Harbor Boulevard	Anaheim	Orange	Residential	Suburban
06-059-2001-81102-2	1985	23022 El Toro Road	El Toro	Orange	Residential	Suburban
06-059-2022-81102-1	1999	26081 Via Pera	Mission Viejo	Orange	Residential	Suburban
06-065-0003-81102-1	1993	Norconian-US NFAC	Norco	Riverside	Residential	Urban/Center City
06-065-0012-81102-1	1998	200 S. Hathaway Street	Banning	Riverside	Commercial	Suburban
06-065-6001-81102-1	1985	237 1/2 N. "D" Street	Perris	Riverside	Commercial	Urban/Center City
06-065-8001-81102-2	1985	5888 Mission Boulevard	Rubidoux	Riverside	Residential	Suburban
06-071-0005-81102-1	1980	Lake Gregory-Lake Drive	Crestline	San Bernardino	Residential	Rural
06-071-0025-81102-1	1998	1408 Francis Street	Ontario	San Bernardino	Industrial	Suburban
06-071-2002-81102-2	1985	14360 Arrow Boulevard	Fontana	San Bernardino	Industrial	Suburban
06-071-4003-81102-1	1993	500 N. Dearborn	Redlands	San Bernardino	Residential	Suburban
06-071-6001-81102-2	1985	Airport	Ontario	San Bernardino	Commercial	Rural
06-071-9004-81102-2	1988	24302 4th Street	San Bernardino	San Bernardino	Commercial	Suburban

Table C-2

Comparison of California PM_{10} Standard Exceedances at the School Monitor and Other Regional Monitors

Browning-Ferris Industries of California, Inc.

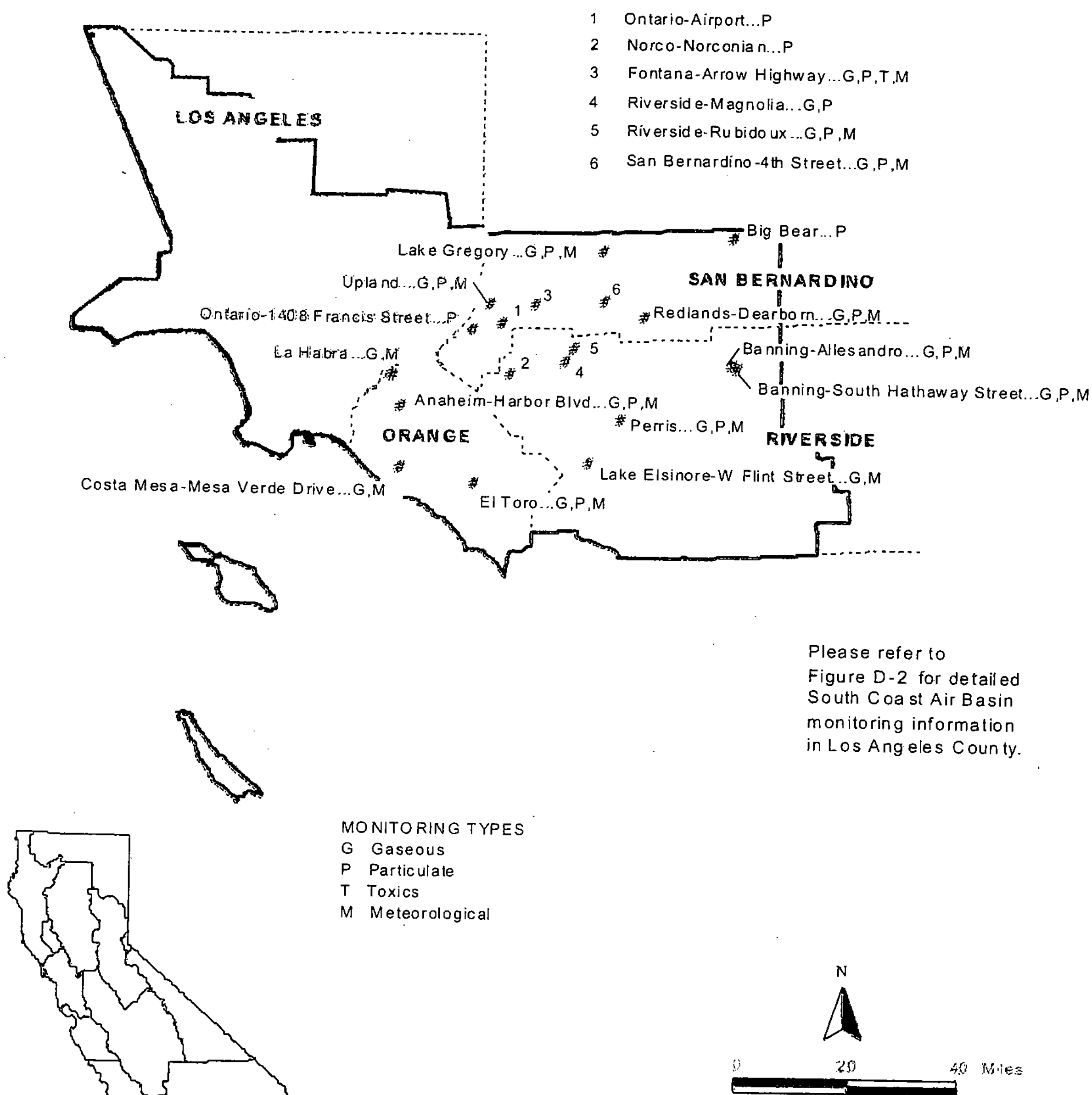
Los Angeles, California

Monitor	24-Hour PM_{10} Standard			Annual PM_{10} Standard	
	Number of Data Points	Number of Exceedances	Percentage of Exceedances	Annual Average[1] ($\mu g/m^3$)	Exceedance?
Van Gogh E.S.	29	7	24%	35.2	Yes
Anaheim	58	5	9%	32.4	Yes
Azusa	56	22	39%	43.8	Yes
Banning	47	6	13%	28.5	Yes
Burbank	58	8	14%	37.3	Yes
Crestline	31	5	16%	33.2	Yes
Fontana	57	29	51%	48.4	Yes
Hawthorne	57	10	18%	36.5	Yes
Long Beach	54	3	6%	33.6	Yes
Los Angeles	52	7	13%	38.8	Yes
Mission Viejo	56	3	5%	29.6	Yes
Norco	51	17	33%	42.3	Yes
Ontario	60	23	38%	44.3	Yes
Perris	59	21	36%	43.0	Yes
Redlands	50	16	32%	41.4	Yes
Rubidoux	60	40	67%	55.6	Yes
San Bernardino	56	31	55%	49.2	Yes
Santa Clarita	60	7	12%	32.4	Yes

Note:

[1] Annual average calculated as mean of 24-hour average concentrations for days that coincide with the SCAQMD monitors' sixth day sampling schedule

Figure C-1: South Coast Air Basin Monitoring Stations (1998 - 1999)

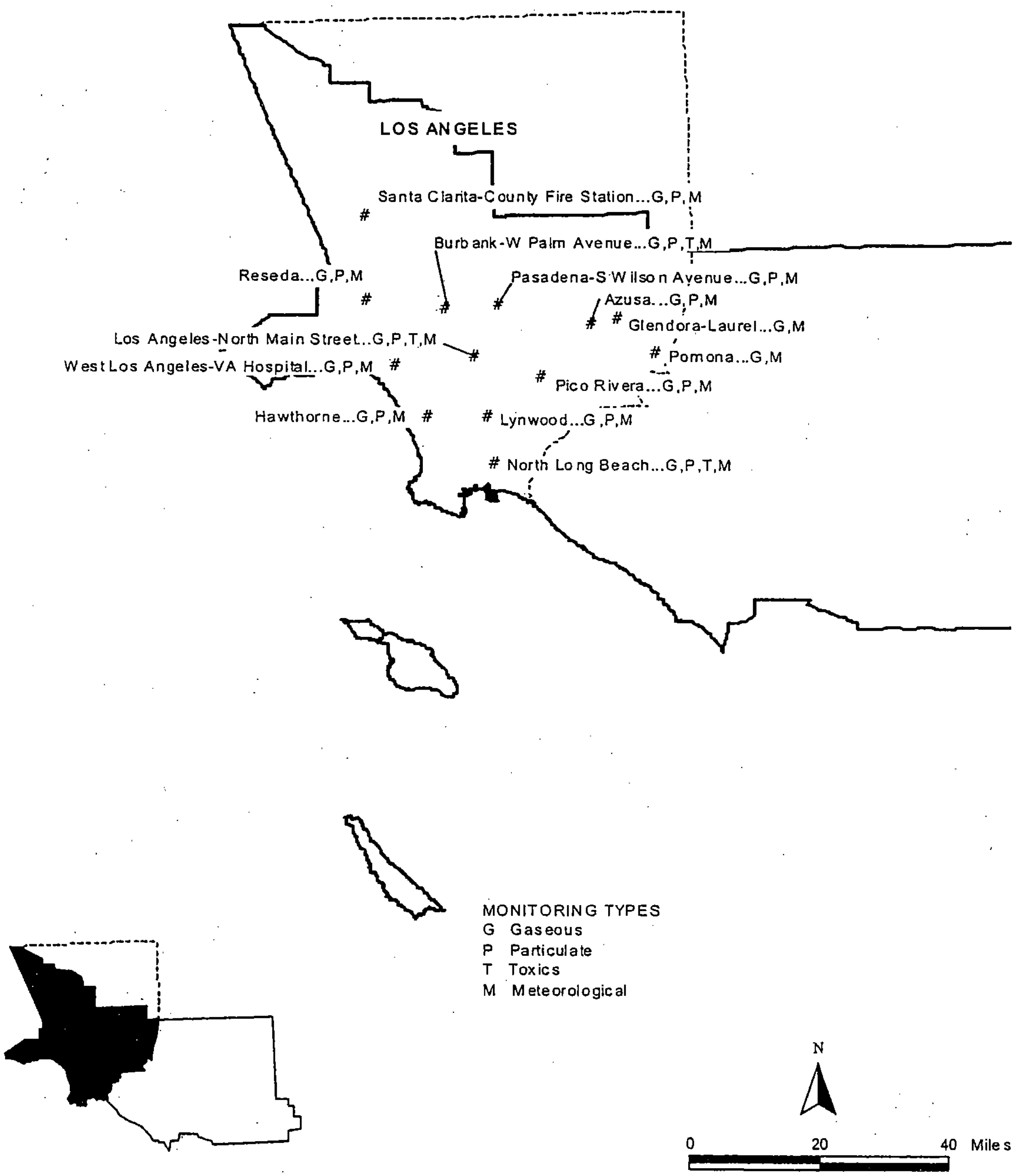


Source: State and Local Network Air Monitoring Plan (http://www.arb.ca.gov/aqd/namslams/namslams.htm)

Figure C-2: South Coast Air Basin

Monitoring Stations - Los Angeles County

(1998 - 1999)



Source: State and Local Network Air Monitoring Plan (http://www.arb.ca.gov/aqd/namslams/namslams.htm)

Figure C-3
Location of Regional PM_{10} Monitors Relative to School Monitor
Browning-Ferris Industries of California, Inc.
Los Angeles, California

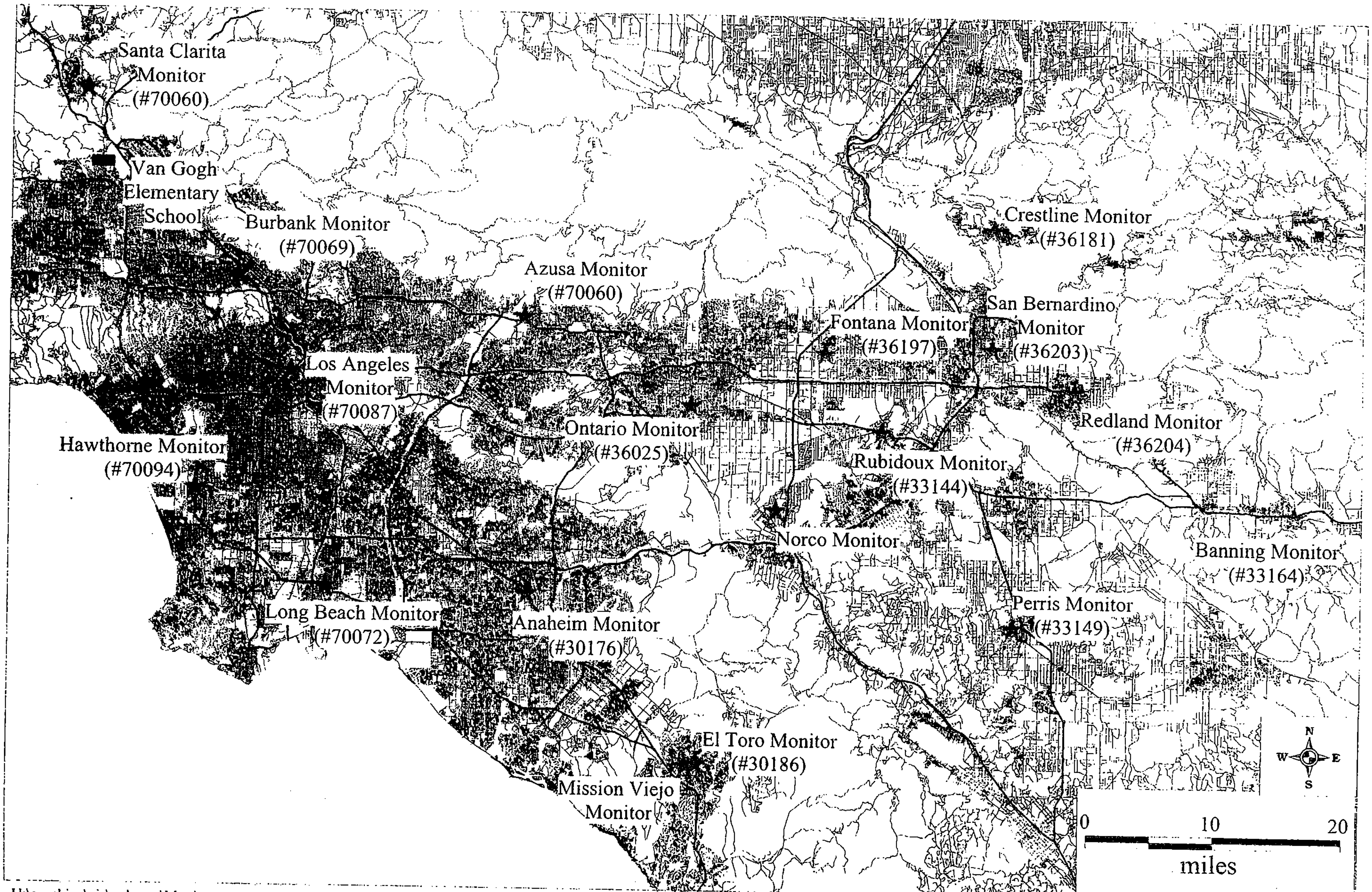


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Table D-1

Comparison of 24-Hour Average Black Carbon Concentrations at the School Monitor and Other Regional Monitors (MATES-II)

Browning-Ferris Industries of California, Inc.

Los Angeles, California

Monitor	Number of 24-Hour Averages	24-Hour Average Black Carbon Concentration ($\mu g/m^3$)
Van Gogh E.S.	256	0.98
Anaheim	58	2.30
Burbank	53	3.18
Fontana	59	3.10
Huntington Park	46	4.53
Long Beach	58	2.54
Los Angeles	59	3.53
Pico Rivera	38	4.35
Rubidoux	62	3.39

Table D-2

Comparison of Two-Week Average Black Carbon Concentrations at the School Monitor and Other Regional Monitors (CHS)

Browning-Ferris Industries of California, Inc.

Los Angeles, California

Monitor	Number of Two-Week Averages	Two-Week Average Black Carbon Concentration[1] ($\mu g/m^3$)
Van Gogh E.S.	14	0.94
Glendora	25	0.64
Lake Arrowhead	20	0.26
Lake Elsinore	26	0.49
Lancaster	26	0.48
Long Beach	24	0.92
Mira Loma	24	1.08
Riverside	26	0.74
Upland	25	0.89

Notes:

[1] Averages for CHS monitors are for 1998, the latest year of available data.

Figure D-2
Location of CHS Regional Black Carbon Monitors Relative to School Monitor
Browning-Ferris Industries of California, Inc.
Los Angeles, California

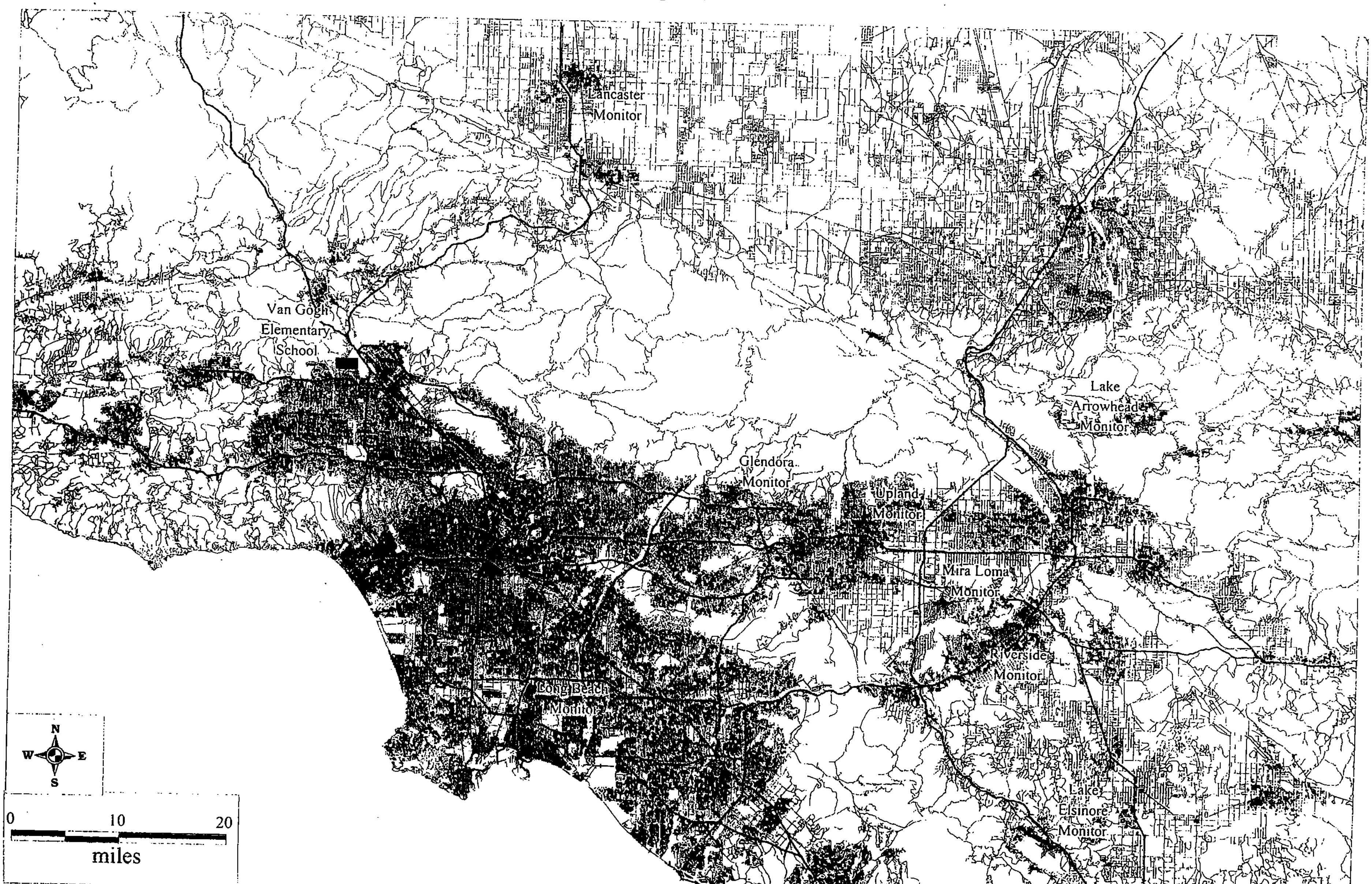

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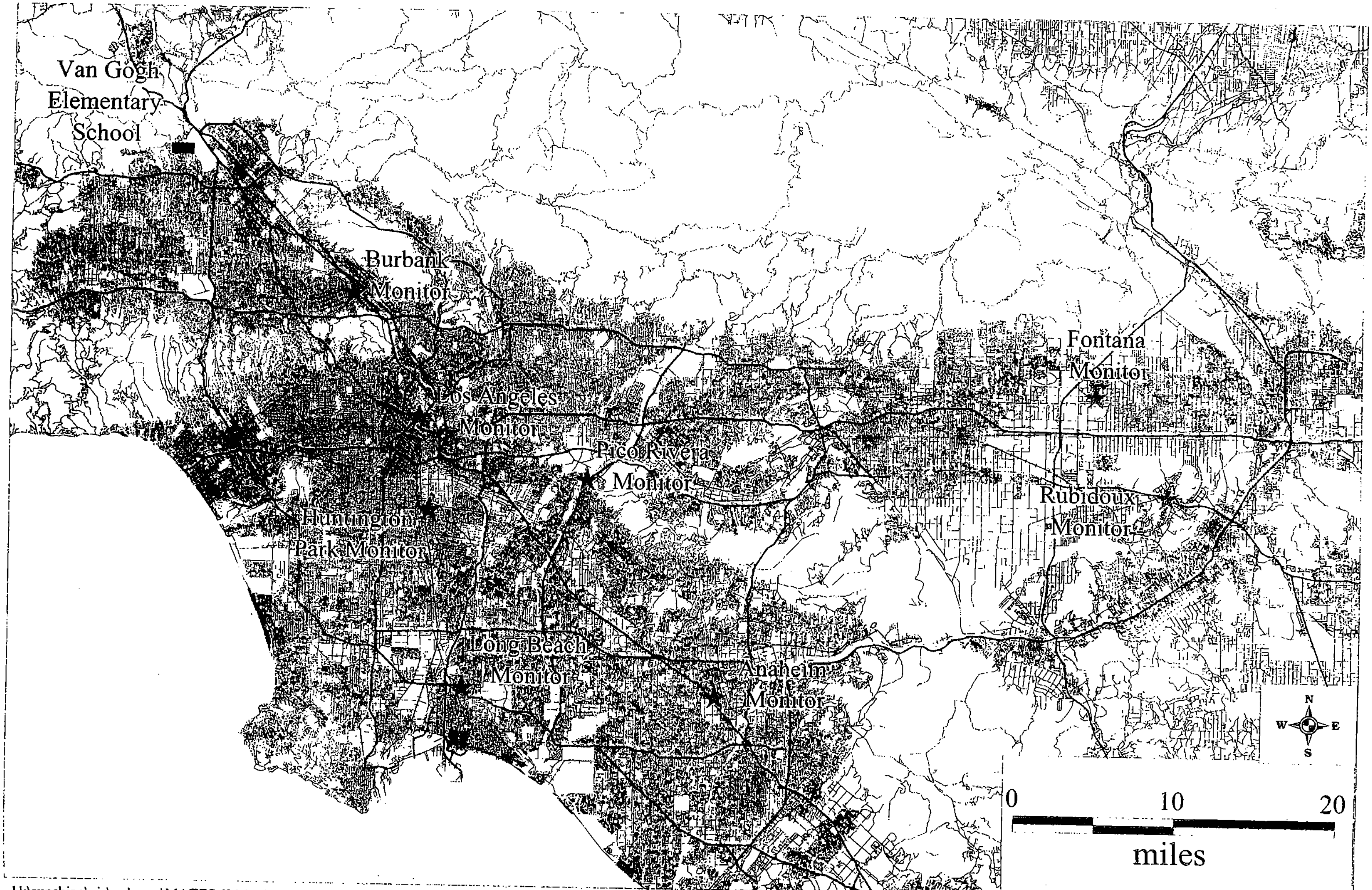
Figure D-1
Location of MATES-II Regional Black Carbon Monitors Relative to School Monitor
Browning-Ferris Industries of California, Inc.
Los Angeles, California



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APPENDIX C

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT'S PM_{10} MONITORING DATA ANALYSIS

APPENDIX C

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT'S PM_{10} AIR MONITORING DATA ANALYSIS

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[1] http://www.epa.gov/air/data/monloc.html

Data is available from the California Air Resources Board (CARB) for these monitors several months after collection. It should be noted that data for the monitoring period was not available from CARB for the El Toro monitor. Our comparison of data collected at the remaining 17 monitors considers the data collected from November 22, 2001 through November 21, 2002. This data was obtained from the CARB website[2].

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The fraction of monitoring days that exceeded the California 24-hour standard ranged from 5% to 67% for the 17 regional SCAQMD monitors. The average exceedance rate at the 17 SCAQMD monitors was 27%. The school monitor recorded exceedances of the California 24-hour standard 24% of the time. The annual average PM_{10} concentrations for the 17 regional SCAQMD monitors ranged from 28.5 $\mu g/m^3$ to 55.6 $\mu g/m^3$. The average annual average PM_{10} concentration at the 17 SCAQMD monitors was 39.4 $\mu g/m^3$. The annual average PM_{10} concentration at the school monitor was 35.2 $\mu g/m^3$. Thus, the PM_{10} concentrations measured at the school monitor are at the lower end of concentrations measured at monitors throughout SCAQMD.

[2] http://www.arb.ca.gov/adam/cgi-bin/db2www/adamweekly.d2w/start

Table C-1
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Los Angeles, California

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06-059-2022-81102-1	1999	26081 Via Pera	Mission Viejo	Orange	Residential	Suburban
06-065-0003-81102-1	1993	Norconian-US NFAC	Norco	Riverside	Residential	Urban/Center City
06-065-0012-81102-1	1998	200 S. Hathaway Street	Banning	Riverside	Commercial	Suburban
06-065-6001-81102-1	1985	237 1/2 N. "D" Street	Perris	Riverside	Commercial	Urban/Center City
06-065-8001-81102-2	1985	5888 Mission Boulevard	Rubidoux	Riverside	Residential	Suburban
06-071-0005-81102-1	1980	Lake Gregory-Lake Drive	Crestline	San Bernardino	Residential	Rural
06-071-0025-81102-1	1998	1408 Francis Street	Ontario	San Bernardino	Industrial	Suburban
06-071-2002-81102-2	1985	14360 Arrow Boulevard	Fontana	San Bernardino	Industrial	Suburban
06-071-4003-81102-1	1993	500 N. Dearborn	Redlands	San Bernardino	Residential	Suburban
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06-071-9004-81102-2	1988	24302 4th Street	San Bernardino	San Bernardino	Commercial	Suburban

Table C-2
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Los Angeles, California

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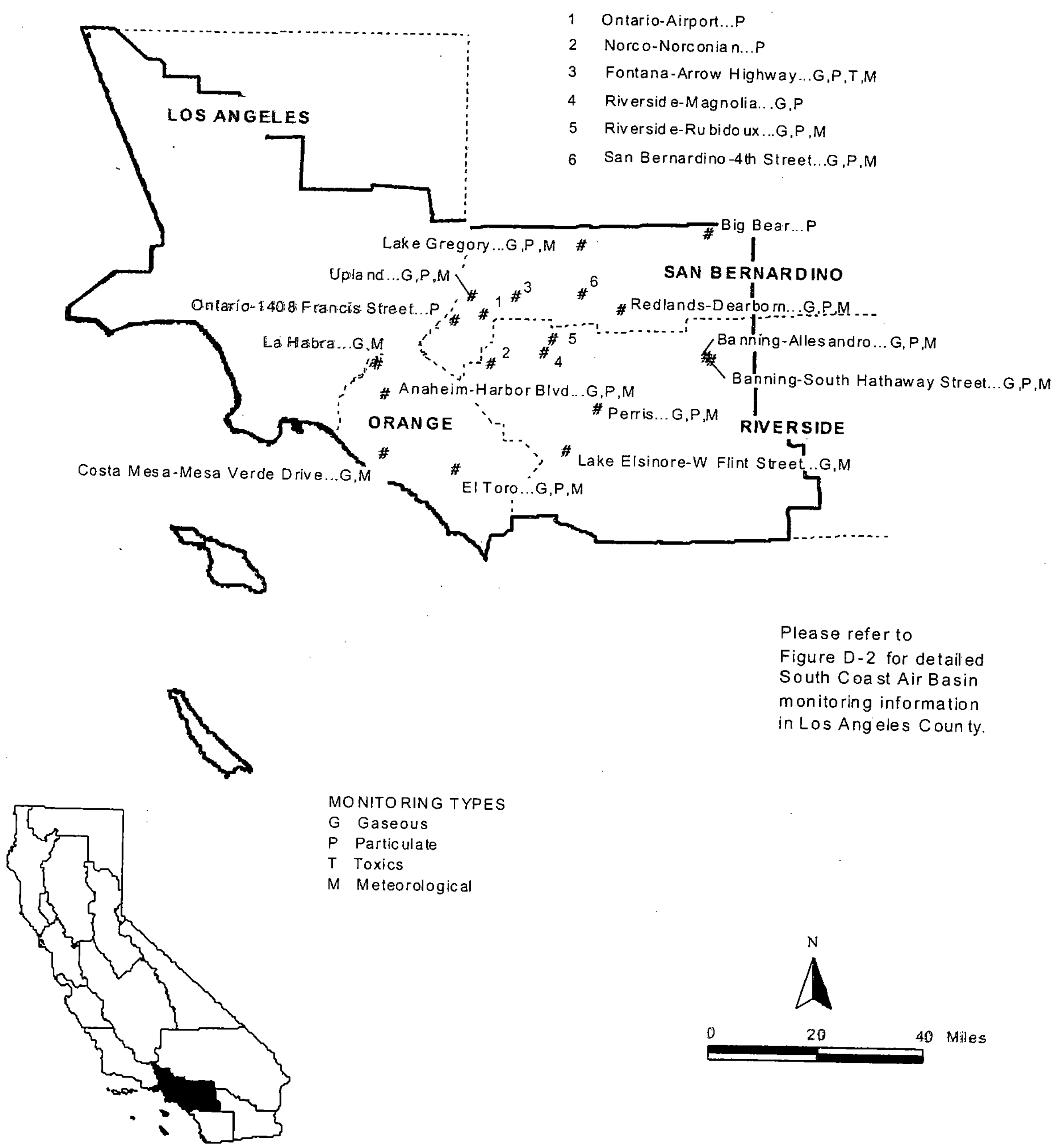
Anaheim	58	5	9%	32.4	Yes
Azusa	56	22	39%	43.8	Yes
Banning	47	6	13%	28.5	Yes
Burbank	58	8	14%	37.3	Yes
Crestline	31	5	16%	33.2	Yes
Fontana	57	29	51%	48.4	Yes
Hawthorne	57	10	18%	36.5	Yes
Long Beach	54	3	6%	33.6	Yes
Los Angeles	52	7	13%	38.8	Yes
Mission Viejo	56	3	5%	29.6	Yes
Norco	51	17	33%	42.3	Yes
Ontario	60	23	38%	44.3	Yes
Perris	59	21	36%	43.0	Yes
Redlands	50	16	32%	41.4	Yes
Rubidoux	60	40	67%	55.6	Yes
San Bernardino	56	31	55%	49.2	Yes
Santa Clarita	60	7	12%	32.4	Yes

Note:

[1] Annual average calculated as mean of 24-hour average concentrations for days that coincide with the SCAQMD monitors' sixth day sampling schedule

Figure C-1: South Coast Air Basin
Monitoring Stations
(1998 - 1999)

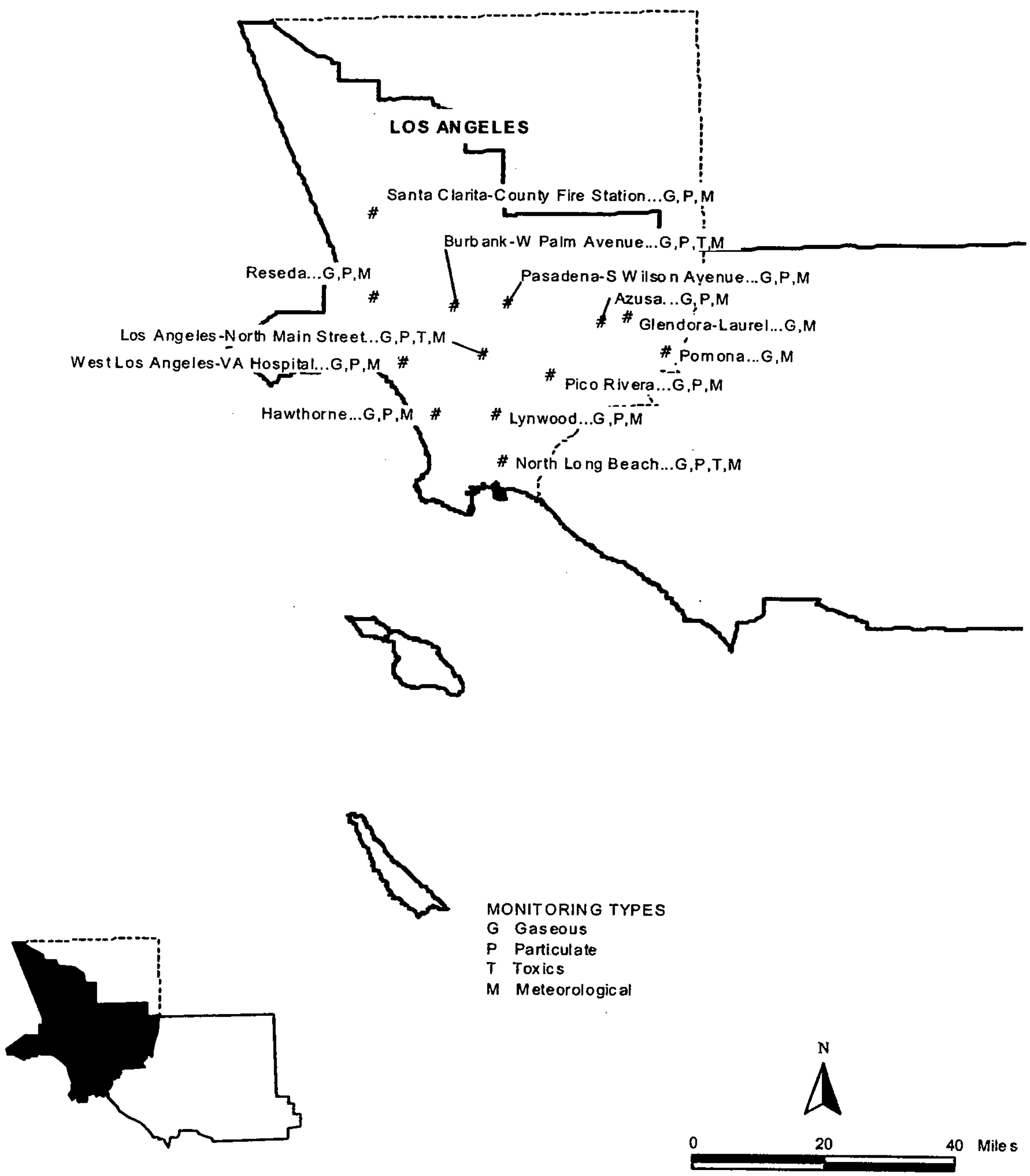


Source: State and Local Network Air Monitoring Plan (http://www.arb.ca.gov/aqd/namslams/namslams.htm)

Figure C-2: South Coast Air Basin

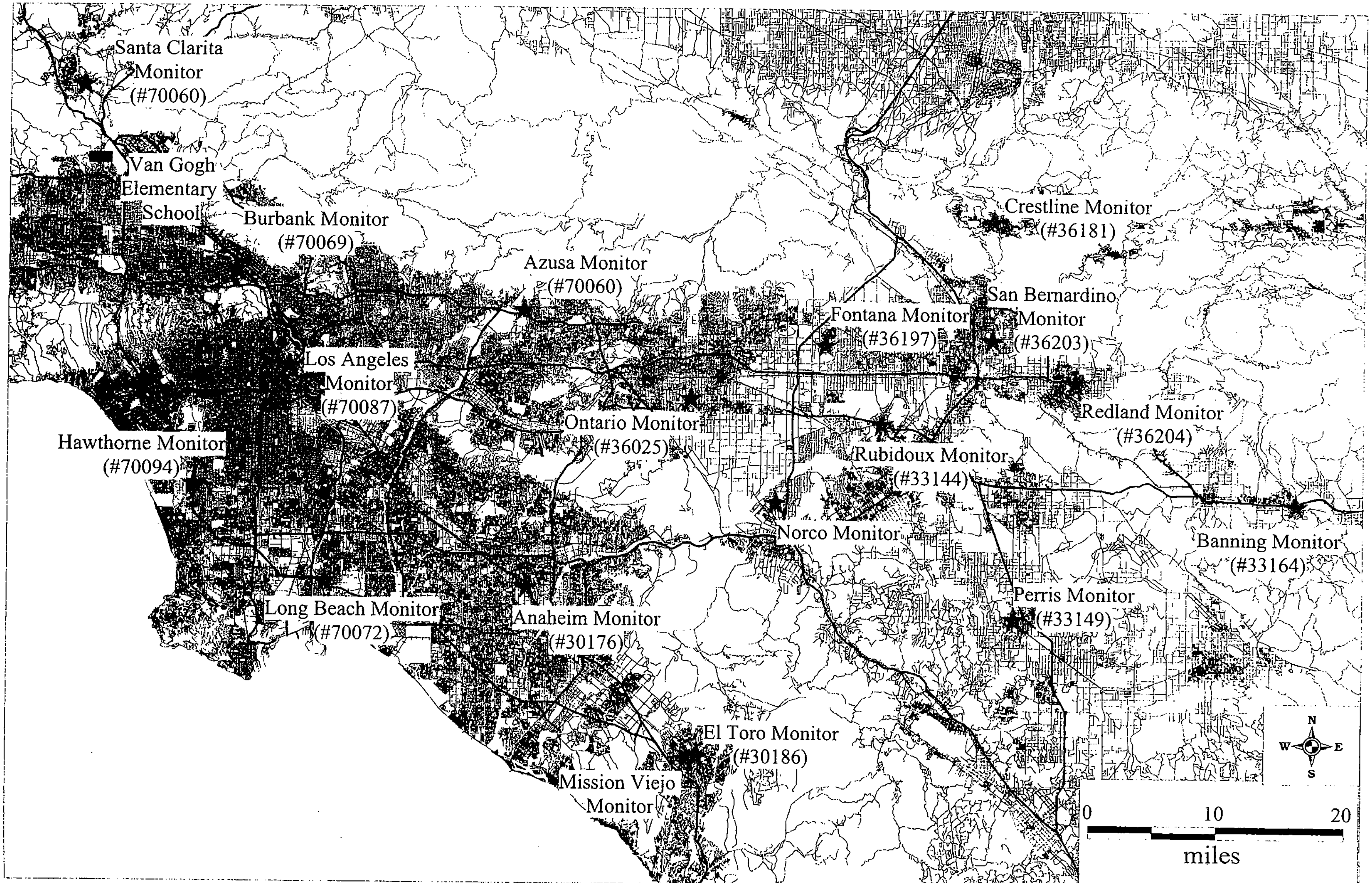
Monitoring Stations - Los Angeles County

(1998 - 1999)



Source: State and Local Network Air Monitoring Plan (http://www.arb.ca.gov/aqd/namslams/namslams.htm)

Figure C-3
Location of Regional PM_{10} Monitors Relative to School Monitor
Browning-Ferris Industries of California, Inc.
Los Angeles, California



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ENVIRON

Table D-1

Comparison of 24-Hour Average Black Carbon Concentrations at the School Monitor and Other Regional Monitors (MATES-II)

Browning-Ferris Industries of California, Inc.
Los Angeles, California

Monitor	Number of 24-Hour Averages	24-Hour Average Black Carbon Concentration ($\mu g/m^3$)
Van Gogh E.S.	256	0.98
Anaheim	58	2.30
Burbank	53	3.18
Fontana	59	3.10
Huntington Park	46	4.53
Long Beach	58	2.54
Los Angeles	59	3.53
Pico Rivera	38	4.35
Rubidoux	62	3.39

Table D-2

Comparison of Two-Week Average Black Carbon Concentrations at the School Monitor and Other Regional Monitors (CHS)

Browning-Ferris Industries of California, Inc.

Los Angeles, California

Monitor	Number of Two-Week Averages	Two-Week Average Black Carbon Concentration[1] ($\mu g/m^3$)
Van Gogh E.S.	14	0.94
Glendora	25	0.64
Lake Arrowhead	20	0.26
Lake Elsinore	26	0.49
Lancaster	26	0.48
Long Beach	24	0.92
Mira Loma	24	1.08
Riverside	26	0.74
Upland	25	0.89

Notes:

[1] Averages for CHS monitors are for 1998, the latest year of available data.

Figure D-2
Location of CHS Regional Black Carbon Monitors Relative to School Monitor
Browning-Ferris Industries of California, Inc.
Los Angeles, California

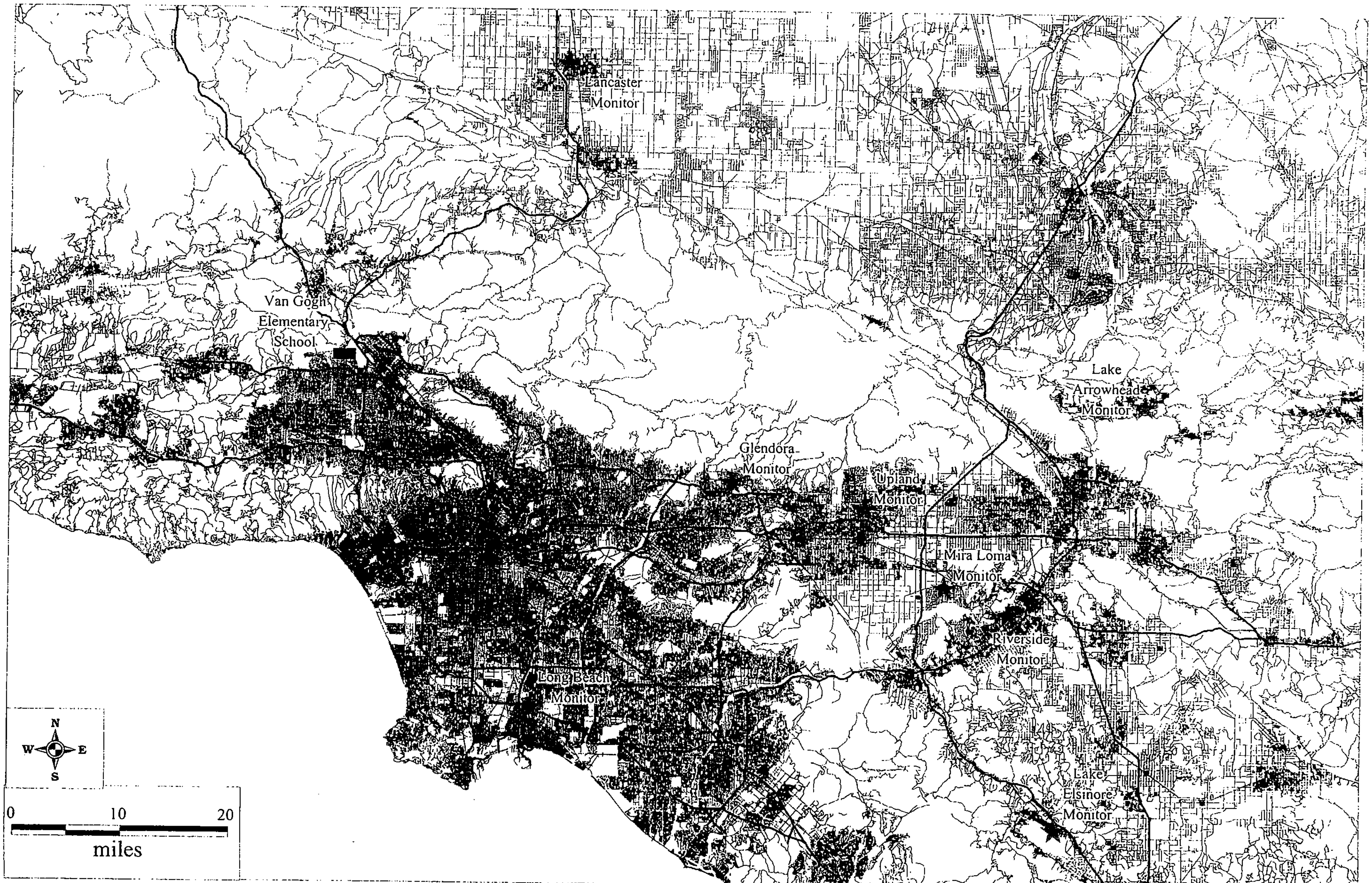

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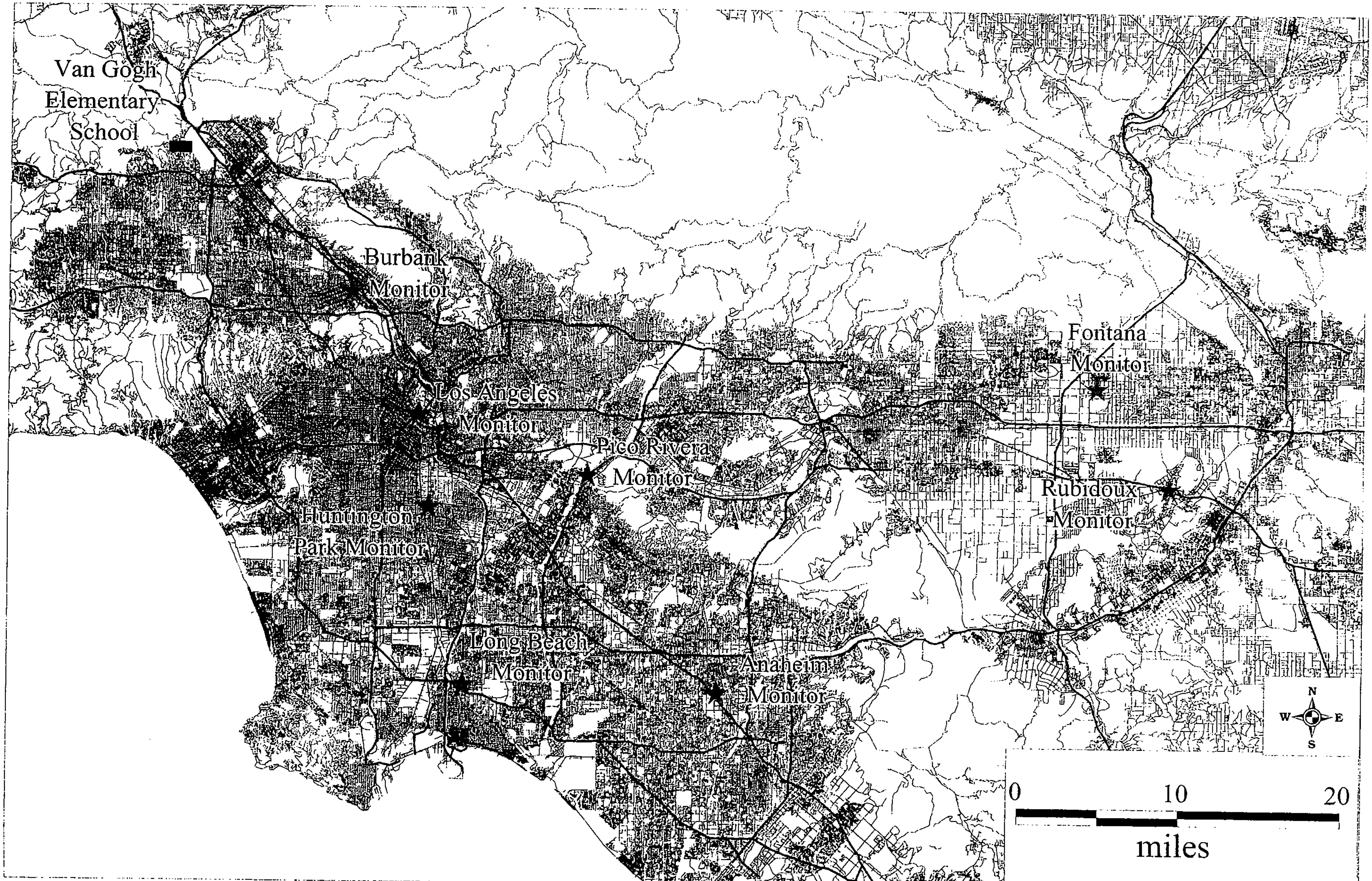
Figure D-1
Location of MATES-II Regional Black Carbon Monitors Relative to School Monitor
Browning-Ferris Industries of California, Inc.
Los Angeles, California



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ENVIRON

7.9 *Volumetric Flow Calibration*

The screen is used for auditing and calibrating the volumetric flow system of the BAM 1020. The BAM can be calibrated to temperature, pressure and flow measurements from external auditing equipment. The Volumetric Flow Calibration screen is shown in Figure 38.

Note: This screen becomes available in the Test menu when the VOLUMETRIC flow type has been selected from the SETUP>CALIBRATE screen. The BAM must also be equipped with the volumetric flow hardware—BX-961. A Model 592 temperature sensor must be connected to back panel channel 6. Refer to Figure 43 of APPENDIX F for sensor hookup.

Figure 38: Volumetric Flow Calibration Screen

```
        VOLUMETRIC FLOW CALIBRATION MODE
F1=RESTORE DEFAULT
                       BAM         REFERENCE
AMBIENT TEMPERATURE:  21.8C       21.8C
BAROMETRIC PRESSURE:  737mmHg     737mmHg
VOLUMETRIC FLOWRATE:   0.01/min  16.71/min

ADJUST/SAVE   NEXT      PUMP ON     EXIT
```

To perform a volumetric flow audit you will need reference temperature, pressure and flow meter equipment. Then follow these steps.

1. If necessary correct the BAM ambient temperature reading (BAM). Enter the externally measured reference temperature value in the REFERENCE field. Use the up and down arrows to edit the field. Press the ADJUST/SAVE button to correct the BAM ambient temperature reading. The BAM and REFERENCE values should now be the same.
2. Press the NEXT button and repeat the same steps for barometric pressure.
3. After the temperature and pressure readings are correct press the PUMP ON button. After the flow rate has stabilized compare the BAM volumetric flow rate against a reference flow meter. Take the reference flow meter value and enter it into the REFERENCE field. If the BAM volumetric flow rate is not the same as the reference flow meter correct the BAM reading by pressing the ADJUST/SAVE button.

APPENDIX E

MONITORING EQUIPMENT MANUFACTURER'S MAINTENANCE AND QUALITY ASSURANCE RECOMMENDATIONS

11.2 Air Flow Rate

The particle size separation characteristics of the Andersen PM_{10} inlet require that specific volumetric air flow rates be maintained during operation. Particle laden air passing through the inlet is forced to take a sharp turn upon entry. A change in the inlet entrance velocity will result in a change in the nominal particle size collected. For this reason, the air flow rate must be maintained at a constant air flow rate of 16.7 actual L/min (1 m^3/hr) ±10%.

11.2.1 Flow Rate Audit. To insure an accurate measurement of PM_{10} concentrations, the EPA stipulates air flow rate audit frequencies for all samplers used to report data into the national data base. Please refer to *Quality Assurance Handbook for Air Pollution Measurement Systems*, Volume 2, Section 2.10 for basic requirements. The instrument's air flow rate should be checked upon installation, after maintenance activities, and at routine intervals throughout the year (at least once per calendar quarter).

11.2.1.1 Several commercially available air flow rate measurement standard devices are available. The manufacturer recommends a (calibrated) dry gas test meter with a display that is easily read to tenths and preferably hundredths of a liter. A dry gas test meter has a low pressure drop across the meter and is reproducible, rugged, and relatively inexpensive. Other measuring devices may be used; however, the manufacturer does not recommend mass flow meters with high pressure drop across the meter.

11.2.1.2 The SA 247 air flow rate measuring cap is used to replace the SA 246b PM_{10} inlet to audit the air flow rate. Remove the SA 246b inlet and place the SA 247 cap with hose barb connector on top of the inlet drift tube. An O-ring seal inside the SA 247 air flow measuring cap assures an airtight seal. Attach a leak-free vacuum hose from the hose barb on the cap to the outlet side of the dry gas test meter. Open the inlet side of the dry gas test meter to the atmosphere for no resistance.

11.2.1.3 Set the instrument to measure flow rate in terms of actual operating conditions (see Section 10.2.6). Use the dry gas test meter and a stopwatch to measure the flow rate of the instrument. If the dry gas test meter is calibrated in units of standard volume at EPA reference conditions (298 K, 1013 kPa), use a thermometer and barometer to measure the actual ambient air temperature and pressure so that the measured flow rate in standard units (std L/hr) can be converted to actual units (actual L/hr) using the following equation:

$$Q_a = Q_{std}\,(P_{std})/(T_{std})\,(T_a/P_a)$$

where:

Q_a = measured flow rate in actual L/hr.
Q_{std} = measured flow rate in std L/hr.
P_{std} = EPA reference pressure (1013 kPa).
T_{std} = EPA reference temperature (298 K).
T_a = actual ambient temperature (K).
P_a = actual barometric pressure (kPa).

11.2.1.4 To insure a good reproducible air flow rate measurement, the time from start to stop of an audit with the dry gas test meter should be 10 min. While the air flow rate audit is being made with the dry gas test meter, monitor the air flow rate indicated by the instrument.

11.2.1.5 Compare the air flow rate measured with the dry gas test meter to the instrument's preset air flow rate (design flow rate of SA 246b inlet = 1,000 actual L/hr) and to the sampler indicated flow rate. If the audited air flow rate differs from the set or indicated flow rates of the instrument by more than 10%, contact the manufacturer for assistance and service.

11.2.2 Flow Rate Calibration.

11.2.2.1 As discussed in Section 7.2.3, the air flow rate for the instrument is held constant (within $\pm$0.5%) using a regulator valve that is adjusted based on input from the instrument's flow rate measurement system.

11.2.2.2 The manufacturer recommends no periodic recalibration by the user. However, the field audit described in Section 11.2.1 is required quarterly for any instrument operating as an EPA equivalent method for PM_{10}.

11.3 Leak Check

The manufacturer has not developed any recommended leak checking procedures. Do not put the system under high positive or negative pressure; damage to the measurement system could result.

12. Method Safety

This instrument uses a radioactive source to measure PM_{10}. Only trained personnel with radiological authorization (e.g., the Andersen Service Division) may work on the source (e.g., cleaning the measuring chambers). The source has been secured with tamper-proof hardware and may not be disassembled without authorization.

13. Maintenance

To ensure proper instrument performance, the following maintenance steps must be consistently followed.

13.1 Vacuum Pump

The vacuum pump is the reliable rotary vane vacuum pump (multi-chamber system) with a dry rotor, which is known for its minimal maintenance during continuous service. The pump is supplied as an external unit and is fitted with protective filters.

13.1.1 Protective filter 1 in the suction line is used to protect the pump inlet. If the pump runs for any length of time with a defective sample filter strip or without any sample filter strip at all, check or replace the pump inlet filter. If a dirty pre-filter in the pump if the carbon vanes are intact and the pump does not reach the necessary air delivery rate may be the cause.

13.1.2 Protective filter 2 is mounted on the vacuum pump exhaust and is used to collect the worn carbon vane dust and act as a noise muffler for the vacuum pump. The cloth filter in the pump exhaust should be removed, soap and water cleaned and dried, and replaced each 6 months of pump operation.

13.1.3 Because the pump normally operates with pre-filtered air, carbon vane wear is very slight. The life of a set of carbon vanes is typically more than 1 yr. For this reason, check the carbon vanes at intervals of 2,000-3,000 operating hours (i.e., 3 months) or change yearly. The rotary pumps should be maintained in accordance with the instructions of the pump manufacturer.

13.2 PM_{10} Inlet

6.3 Field Calibration of Flow System

A BAM 1020 can be purchased with one of two flow types—metered or volumetric. Volumetric flow measures the volume of flow in ambient conditions. Metered flow measures the volume of flow in EPA conditions (298 Kelvin and 760 mm-Hg). Each type requires a different set of test equipment and procedure.

To determine the flow type of the BAM under test navigate to the calibrate screen (`SETUP>CALIBRATE`). A password is required. This screen displays the `FLOW TYPE—METERED` or `VOLUMETRIC`. Proceed to step **A** for `METERED` and step **B** for `VOLUMETRIC`.

A. Metered flow type calibration requires a reference volumetric flow meter with a flow audit cap. Met One suggests the BIOS® brand or purchasing the BX-307 option. A reference temperature device also is needed to measure ambient temperature.

1. With vacuum pump OFF record:

   $T_{ambient}$ (T_a)______________Kelvin. (Reference temperature device)

   $P_{ambient}$ (P_a)______________mm-Hg (BAM `OPERATE>NORMAL` screen)

2. In the `SETUP>CALIBRATE` screen set C_v and Q_0 to 1.000 and 0.000 respectively.
3. Cycle filter tape to a new spot. Disconnect the pump tubing from the back of the BAM-1020. In `TEST>PUMP` screen turn ON the pump.

   NOTE: There should not be air flowing through the BAM-1020. Record the indicated flow rate:

   Zero flow (Z_f)_____________LPM.

4. In the `SETUP>CALIBRATE` screen set the Q_0 value to equal the negative of Zero flow. Check the flow rate as described above and make sure the reading is zero ± 0.10 LPM.
5. Reconnect the pump vacuum line.
6. Remove PM_{10} inlet and set aside.
7. Place flow audit cap in place of inlet. Connect the reference flow meter exit tube to the hose barb on the top of the flow audit cap.
8. Using the reference flow meter measure and record actual flow after the pump has been running for 5 minutes. At the same time record the BAM-1020 indicated flow from the `TEST>PUMP` screen.

   Audit (Q_a)______________LPM (Recorded from the reference meter)

   BAM (Q_b)______________LPM (Recorded from the BAM screen)

9. Convert the reference flow to EPA flow:

   $Q_s = Q_a * (P_a / T_a) * (298 / 760)$

10. Compute C_v and Q_o:

    $C_v = Q_s / Q_b$

    $Q_o = -C_v . Z_f$

11. In the `SETUP>CALIBRATE` screen set C_v and Q_o value to the calculated C_v and Q_o from step 10.

12. Turn pump on and compare the values of Q_s and Q_b as described in steps 8—10. They should be within 1% of each other, otherwise return to step 1.

13. Using the flow adjustment knob on the rear of the BAM 1020, adjust the flow until the panel readout shows 17.5 L/minute. This level is within the specification of the PM-10 particle separation head, and will allow for filter loading in high concentration areas. In some cases, this flow can be set at a lower level. Factory consultation is advised if other settings are used.

B. Volumetric flow type calibration requires a reference volumetric flow meter with a flow audit cap. Met One suggests the BIOS® brand or purchasing the BX-307 option.

1. Remove PM_{10} inlet and set aside.
2. Place flow audit cap in place of inlet. Connect the reference flow meter exit tube to the hose barb on the top of the flow audit cap.
4. Navigate to the Volumetric Flow Calibration screen (`TEST>FLOW`).
5. Press the `PUMP ON` key.
6. Allow the BAM and the reference flow meter to run for 5 minutes.
7. On the BAM display under `REFERENCE VOLUMETRIC FLOWRATE` enter the flow measured by the reference flow meter. Press the `ACCEPT/SAVE` key. The BAM is now calibrated to the reference flow meter.